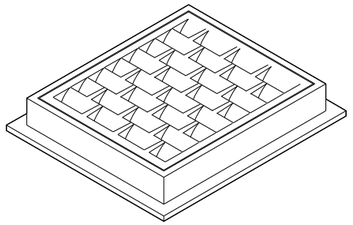
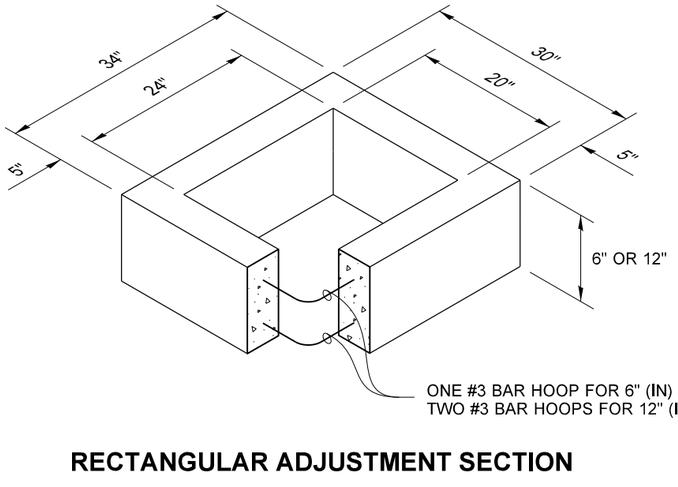
Section 6

Stormwater

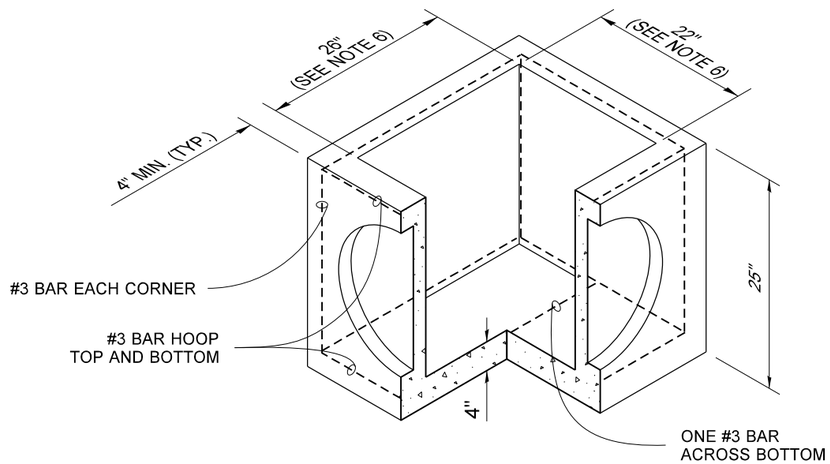
DRAWN BY: MARK SUJKA



FRAME AND VANED GRATE



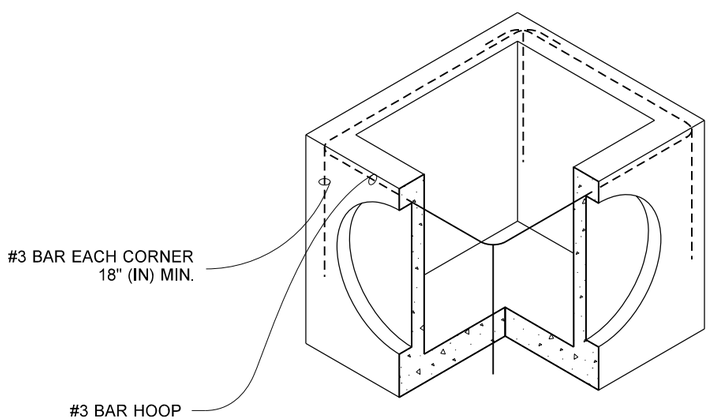
RECTANGULAR ADJUSTMENT SECTION



PRECAST BASE SECTION

PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER (INCHES)
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP * (STD. SPEC. SECT. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. SECT. 9-05.12(1))	15"
PROFILE WALL PVC (STD. SPEC. SECT. 9-05.12(2))	15"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE



SEE NOTE 1

ALTERNATIVE PRECAST BASE SECTION

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.

2. The knockout diameter shall not be greater than 18" (in) . Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.

3. The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).

4. The frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.

5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.

6. The opening shall be measured at the top of the precast base section.

7. All pickup holes shall be grouted full after the inlet has been placed.

CONCRETE INLET

STANDARD PLAN B-25.60-01

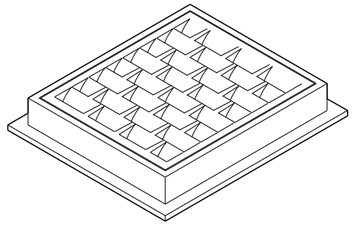
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

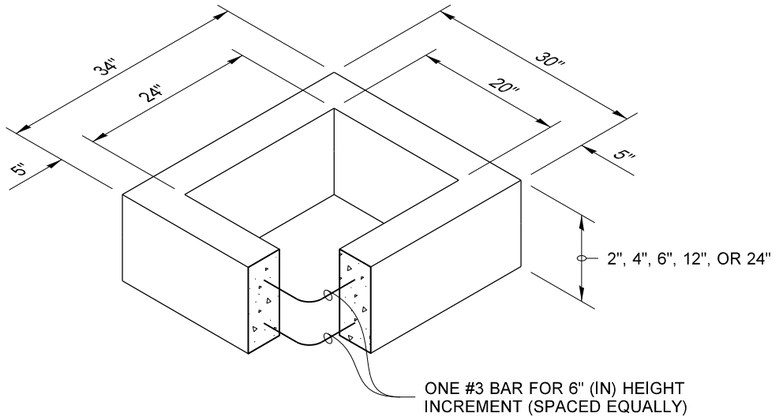
STATE DESIGN ENGINEER

Washington State Department of Transportation

DRAWN BY: LISA CYFORD



FRAME AND VANED GRATE

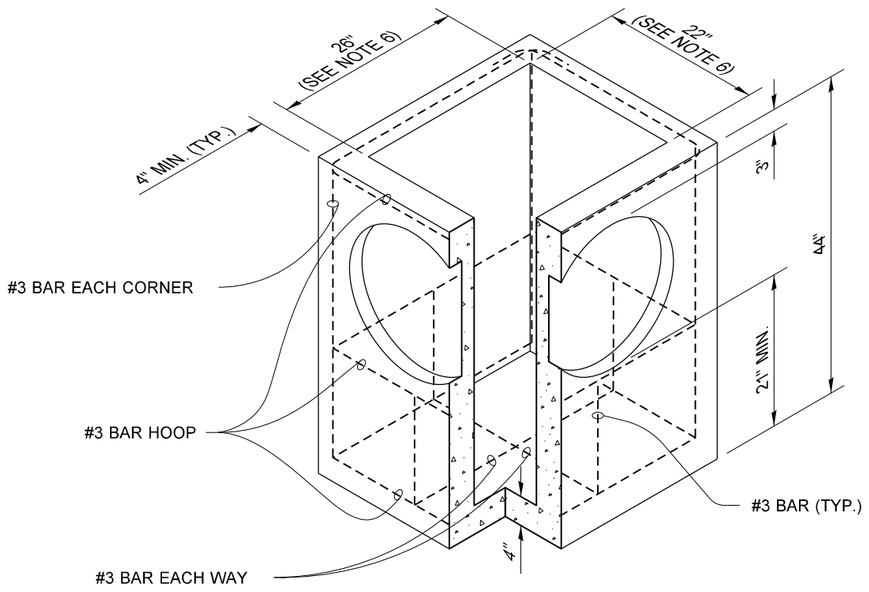


RECTANGULAR ADJUSTMENT SECTION

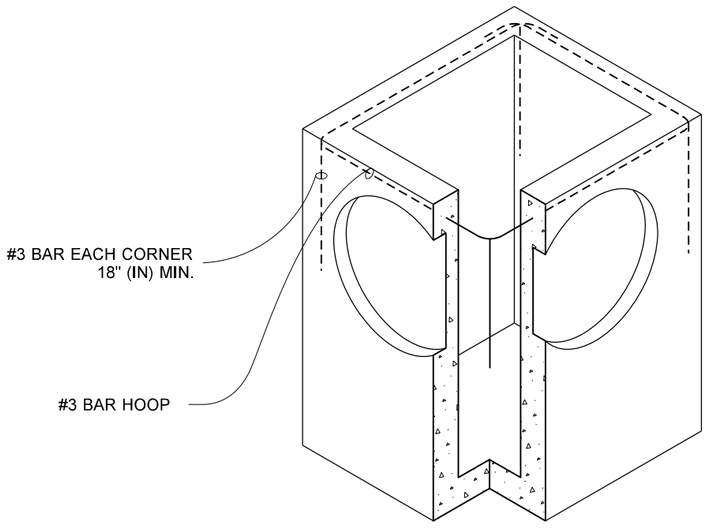
PIPE ALLOWANCES

PIPE MATERIAL	MAXIMUM INSIDE DIAMETER (INCHES)
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP * **(STD. SPEC. SECT. 9-05.20)**	12"
SOLID WALL PVC **(STD. SPEC. SECT. 9-05.12(1))**	15"
PROFILE WALL PVC **(STD. SPEC. SECT. 9-05.12(2))**	15"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE



PRECAST BASE SECTION



(SEE NOTE 1)

ALTERNATIVE PRECAST BASE SECTION

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the ALTERNATIVE **PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.

2. The knockout diameter shall not be greater than 20" (in). Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.

3. The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).

4. The frame and grate may be installed with the flange down, or integrally cast into the adjustment section with flange up.

5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.

6. The opening shall be measured at the top of the **Precast Base Section**.

7. All pickup holes shall be grouted full after the basin has been placed.

JULIE HEILMAN
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REGISTERED
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CATCH BASIN TYPE 1

STANDARD PLAN B-5.20-02

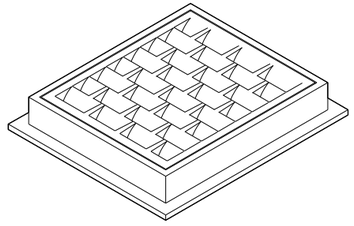
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

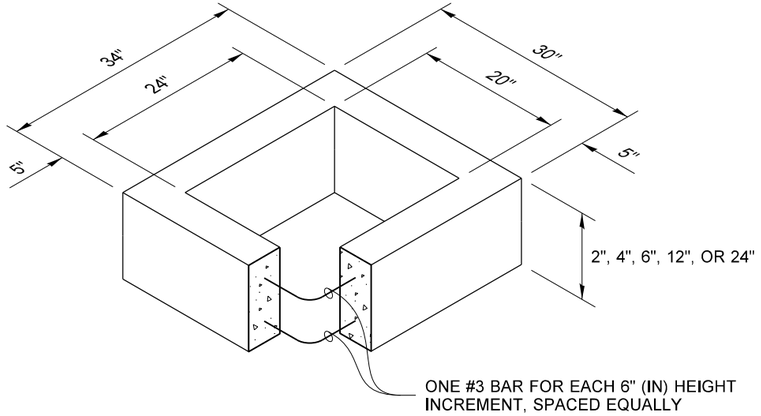
STATE DESIGN ENGINEER

Washington State Department of Transportation

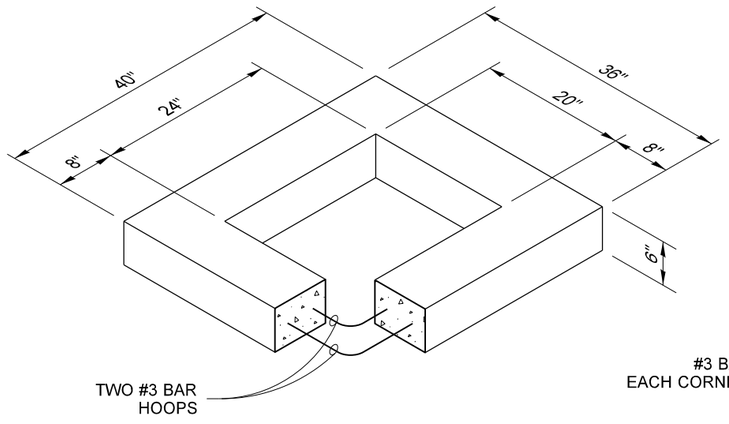
DRAWN BY: LISA CYFORD



FRAME AND VANED GRATE



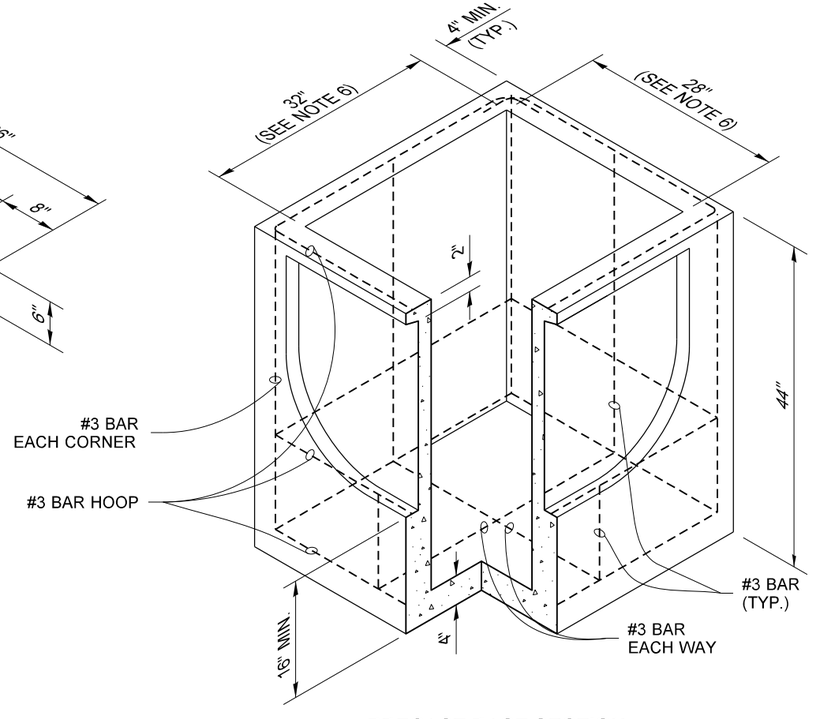
RECTANGULAR ADJUSTMENT SECTION



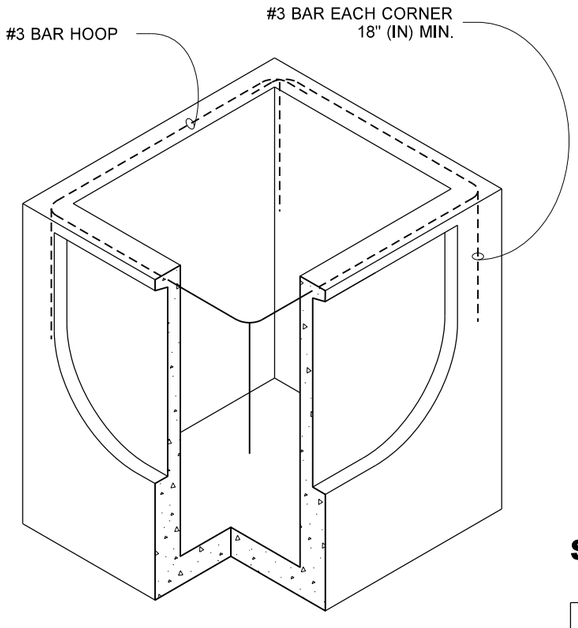
REDUCING SECTION

PIPE ALLOWANCES	
PIPE MATERIAL	**MAXIMUM INSIDE DIAMETER (INCHES)**
REINFORCED OR PLAIN CONCRETE	18"
ALL METAL PIPE	21"
CPSSP * **(STD. SPEC. SECT. 9-05.20)**	18"
SOLID WALL PVC **(STD. SPEC. SECT. 9-05.12(1))**	21"
PROFILE WALL PVC **(STD. SPEC. SECT. 9-05.12(2))**	21"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE



PRECAST BASE SECTION



(SEE NOTE 1)

ALTERNATIVE PRECAST BASE SECTION

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot, shall be used with the minimum required rebar shown in the ALTERNATIVE **PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.

2. The knockout shall not be greater than 26" (in), in any direction. Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.

3. The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).

4. The frame and grate may be installed with the flange down or integrally cast into the adjustment section with flange up.

5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.

6. The opening shall be measured at the top of the Precast Base Section.

7. All pickup holes shall be grouted full after the basin has been placed.

CATCH BASIN TYPE 1L

STANDARD PLAN B-5.40-02

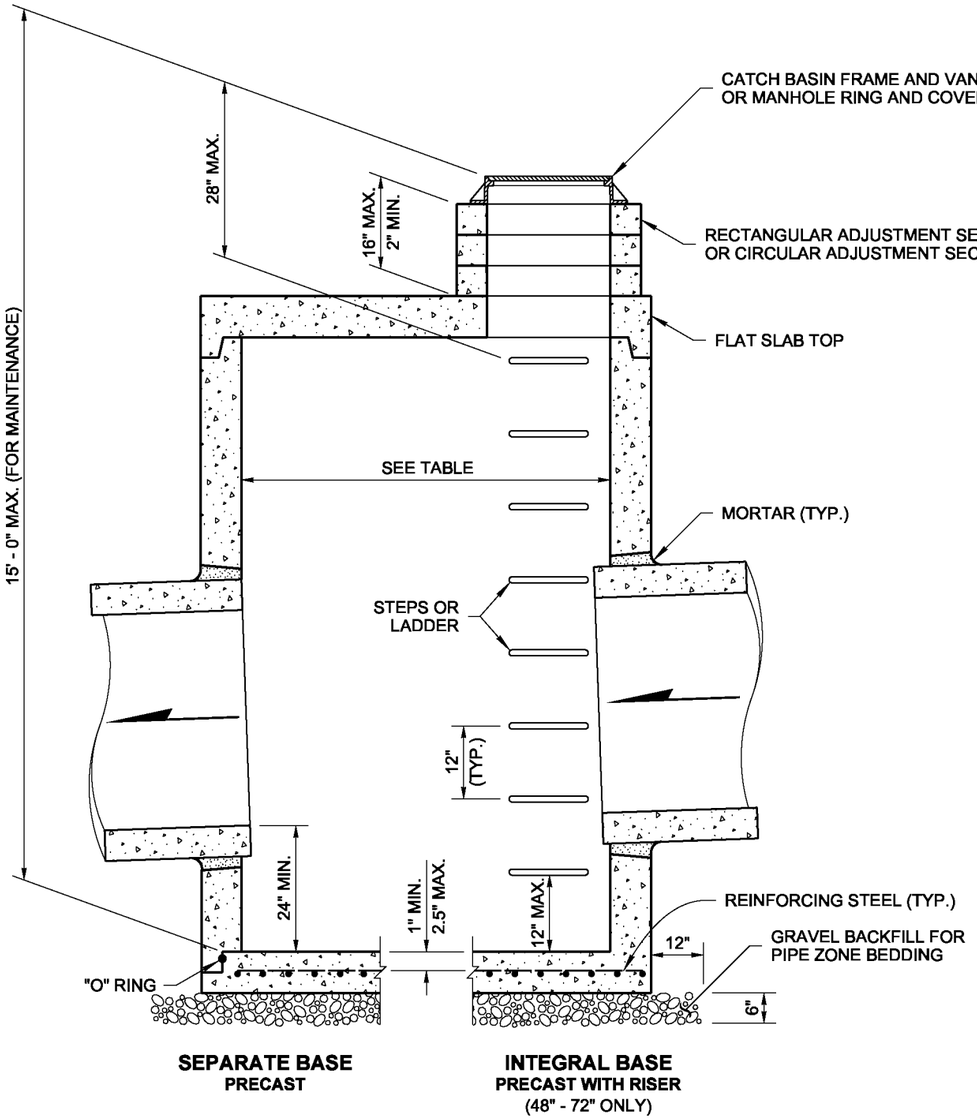
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER

Washington State Department of Transportation

DRAWN BY: LISA CYFORD



NOTES

1. No steps are required when height is 4' or less.
2. The bottom of the precast catch basin may be sloped to facilitate cleaning.
3. The rectangular frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
4. Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification 9-04.3.**

CATCH BASIN DIMENSIONS

CATCH BASIN DIAMETER	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	96"	12"
144"	12"	12"	108"	12"

PIPE ALLOWANCES

CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER				
	CONCRETE	ALL METAL	CPSSP ①	SOLID WALL PVC ②	PROFILE WALL PVC ③
48"	24"	30"	24"	30"	30"
54"	30"	36"	30"	36"	36"
60"	36"	42"	36"	42"	42"
72"	42"	54"	42"	48"	48"
84"	54"	60"	54"	48"	48"
96"	60"	72"	60"	48"	48"
120"	66"	84"	60"	48"	48"
144"	78"	96"	60"	48"	48"

① Corrugated Polyethylene Storm Sewer Pipe **(Standard Specification 9-05.20)**
② **(Standard Specification 9-05.12(1))**
③ **(Standard Specification 9-05.12(2))**

CASEY M. KRAMER
STATE OF WASHINGTON
44535
REGISTERED
PROFESSIONAL ENGINEER

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

CATCH BASIN TYPE 2

STANDARD PLAN B-10.20-01

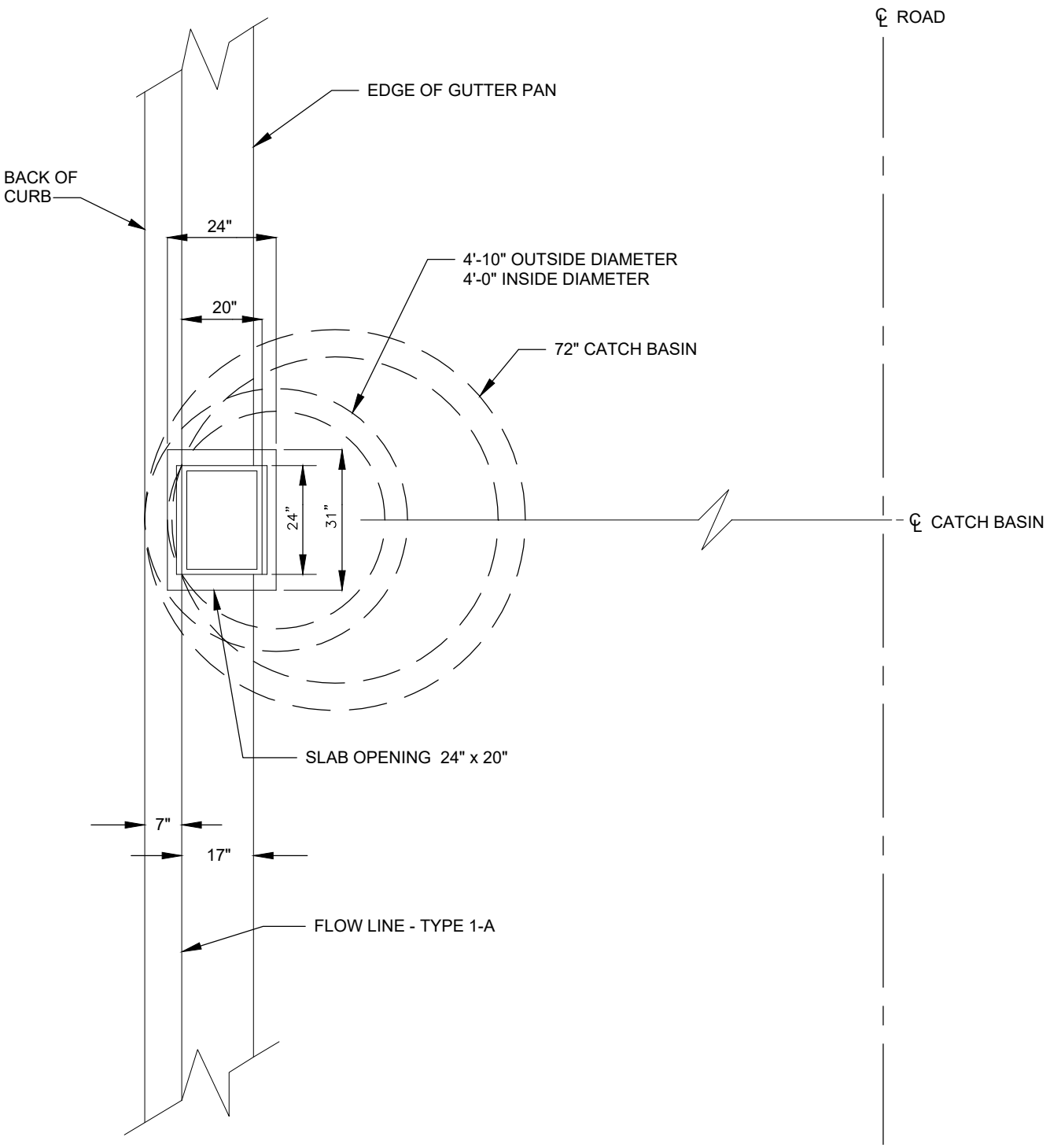
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III — STATE DESIGN ENGINEER

02-07-12 — DATE

Washington State Department of Transportation



PLAN

NTS

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

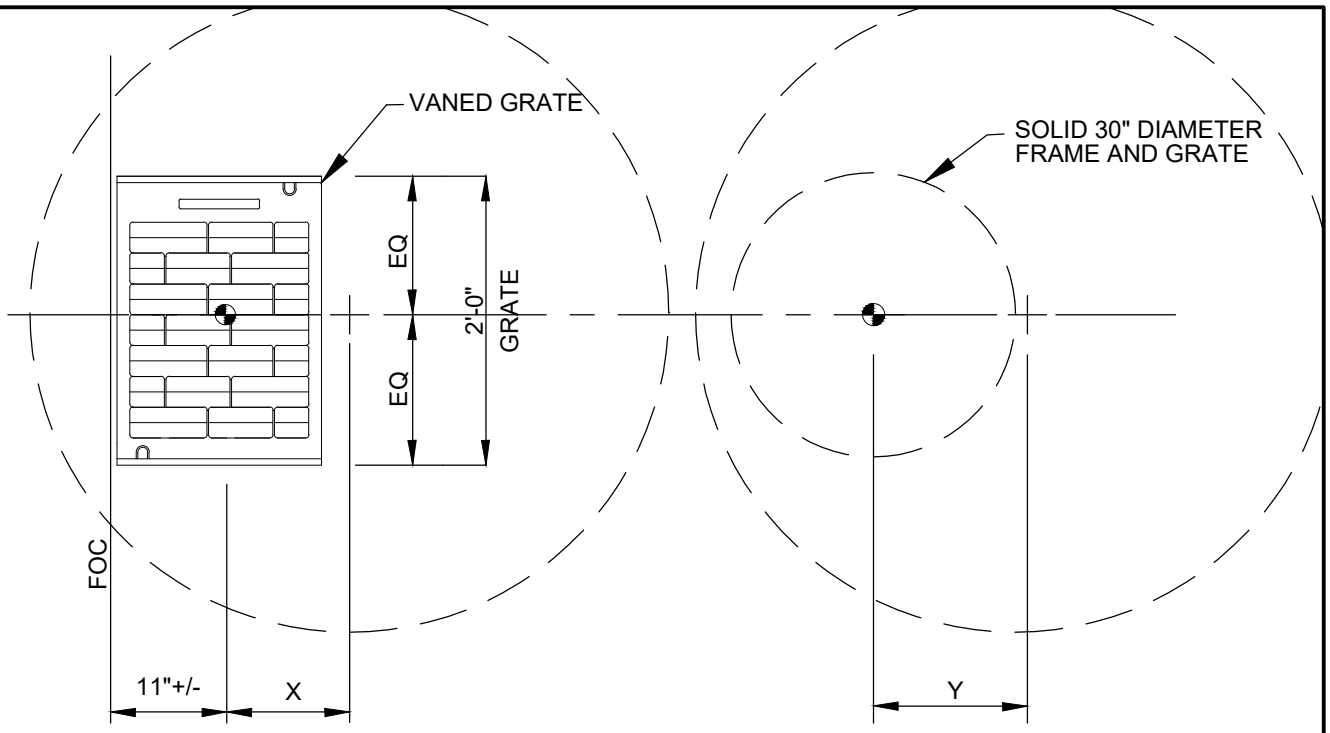
CityofRedmond
WASHINGTON

STANDARD DETAILS

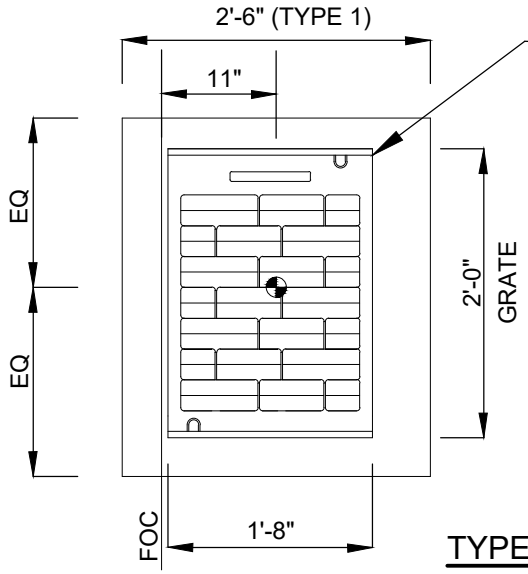
TYPICAL ORIENTATION OF TYPE 2 CB IN CITY STREET SECTION

FILE NAME: SD609A.DWG

DETAIL NUMBER: 609A



PLAN VIEW
NTS



TYPE 1/1L
NTS

CB TYPE 2		X	Y
I.D.	O.D.		
48"	58"	11"	12"
54"	65"	14"	15"
60"	72"	17"	18"
72"	86"	24"	24"

KEY

CENTER OF GRATE

CENTER OF STRUCTURE

NOTES:

1. CENTER OF GRATE = CENTER OF STRUCTURE FOR TYPE 1 AND TYPE 1L STRUCTURES ONLY.
2. SPECIFIED STATION AND OFFSET REFERENCE CENTER OF STRUCTURE FOR ALL DRAINAGE FACILITIES UNLESS OTHERWISE NOTED ON PLANS.
3. ALL GRATES SHALL BE VANED UNLESS OTHERWISE SHOWN.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

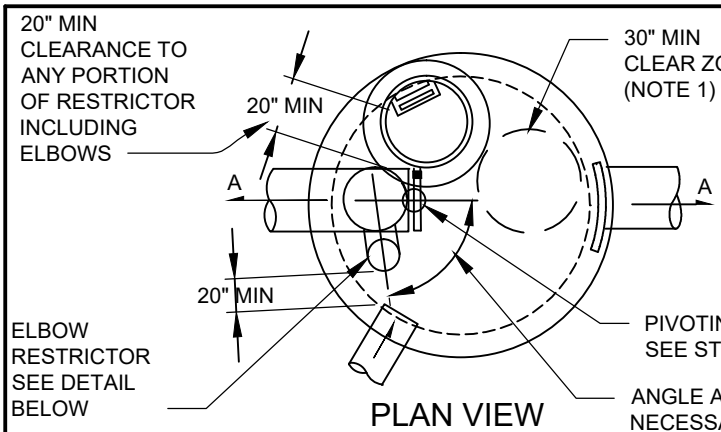
CityofRedmond
WASHINGTON

STANDARD DETAILS

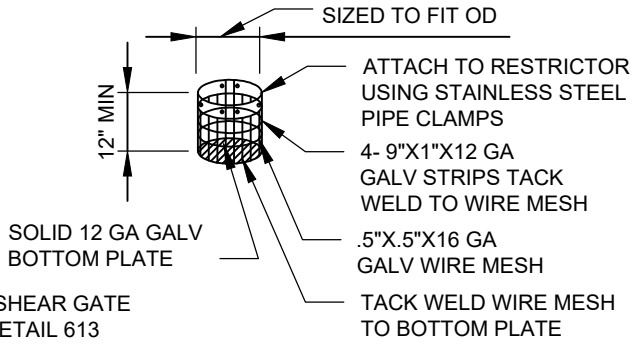
TYPICAL CATCH
BASIN PLACEMENT

FILE NAME: SD609B.DWG

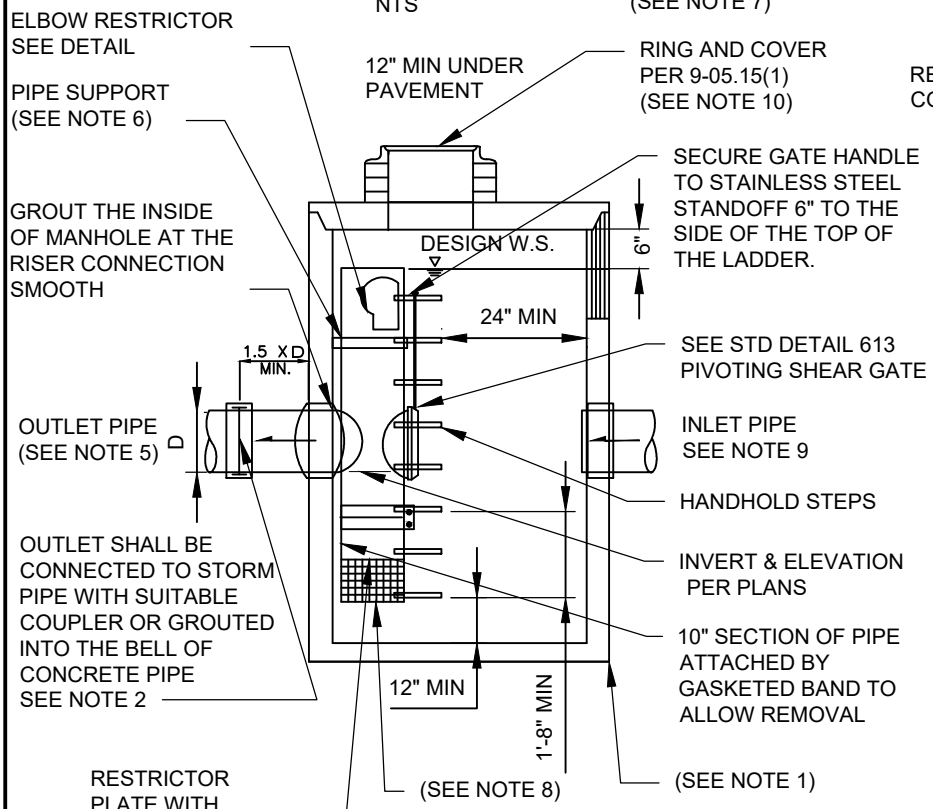
DETAIL NUMBER: 609B



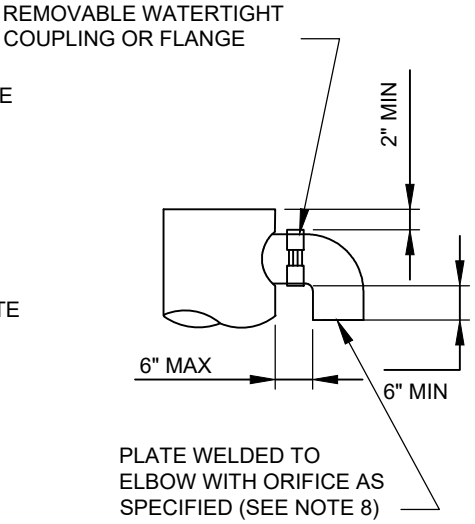
PLAN VIEW
NTS



ORIFICE SCREEN
NTS



SECTION A
NTS



ELBOW
NTS

NOTES:

1. MINIMUM 54" TYPE 2 CB. LARGER MANHOLES REQUIRED AS NEEDED TO PROVIDE MINIMUM 30" DIAMETER CLEAR ZONE NEXT TO RESTRICTOR.
2. RESTRICTOR FABRICATED FROM ALUMINUM OR PVC PIPE.
3. FRAME AND LADDER OR STEPS OFFSET SO:
   A. CLEANOUT GATE IS VISIBLE FROM TOP;
   B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE;
   C. FRAME IS CLEAR OF CURB.
5. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE, OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE ID. LESS ¼ IN.
6. PROVIDE AT LEAST TWO 3 X 0.090 GAUGE STAINLESS STEEL SUPPORT BRACKETS ANCHORED TO CONCRETE WALL WITH ⅝ IN STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED SUPPORTS 2 IN INTO M/H WALL. MAX 3' OC.
7. LOCATE ELBOW RESTRICTOR(S) AS NECESSARY TO PROVIDE MIN CLEARANCE AS SHOWN.
8. ORIFICE SCREEN IS REQUIRED FOR ORIFICES LESS THAN 3" DIAMETER. RESTRICTOR PLATE FROM 12 GAUGE ALUMINUM OR PVC PIPE.
9. PIPE PENETRATIONS SHALL BE WATER TIGHT. SAND COLLAR OR KOR-N-SEAL BOOT.
10. IF OUTLET PIPE IS GREATER THAN 12" DIAMETER HATCH IS REQUIRED PER 9-05.15(5)

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

CityofRedmond WASHINGTON

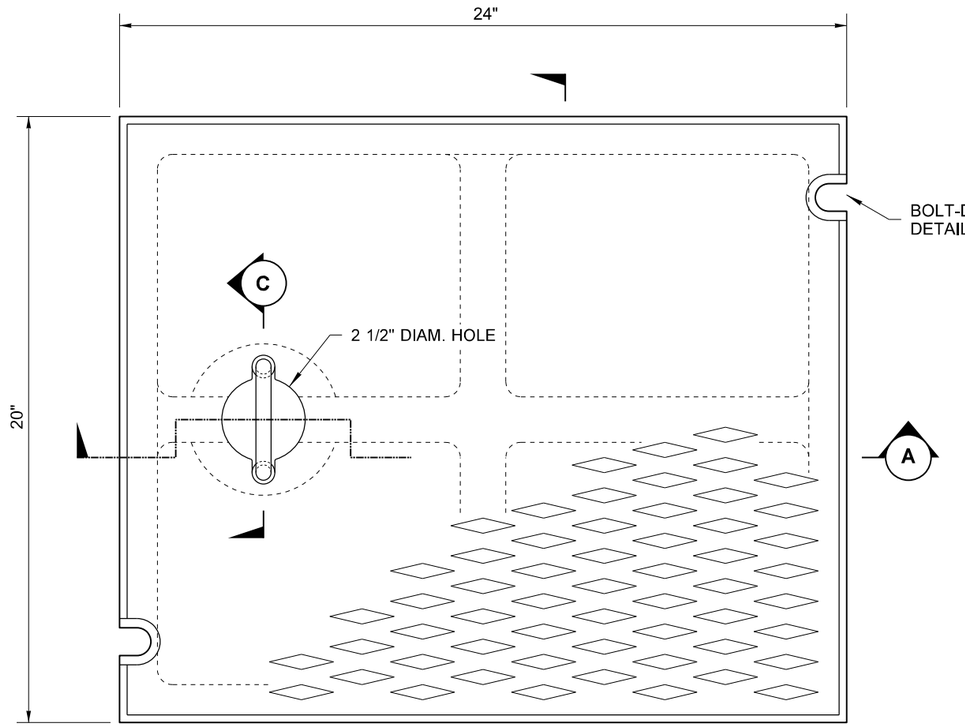
STANDARD DETAILS

FLOW CONTROL STRUCTURE

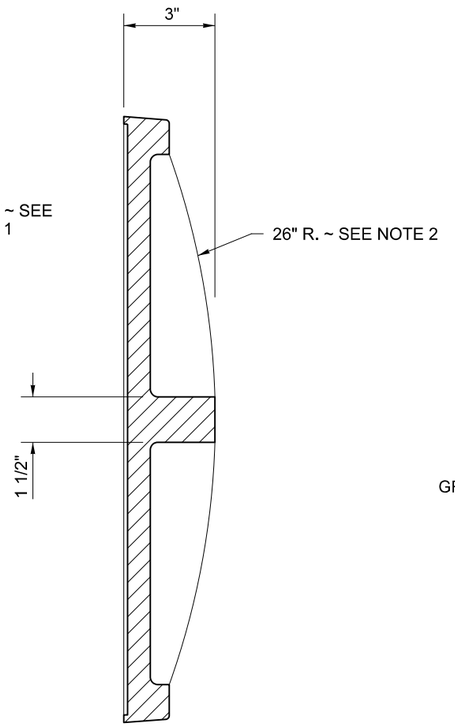
FILE NAME: SD610.DWG

DETAIL NUMBER: 610

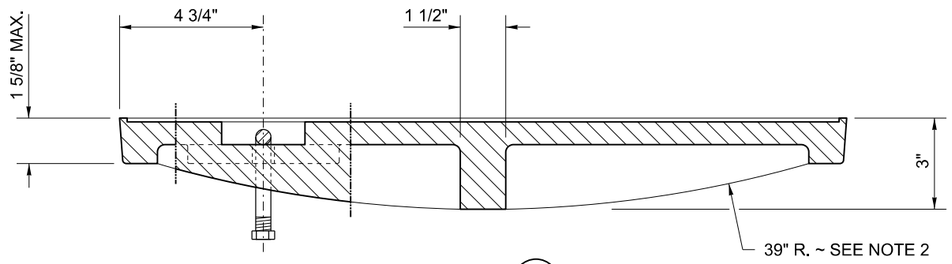
DRAWN BY: FERN LIDDELL



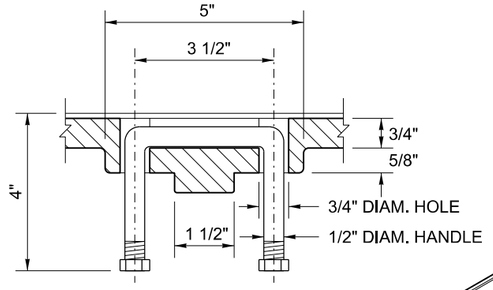
TOP B



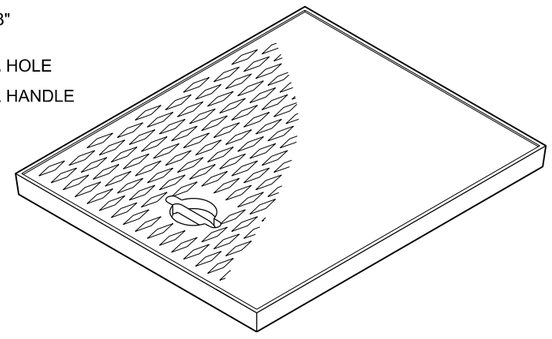
SECTION B



SECTION A



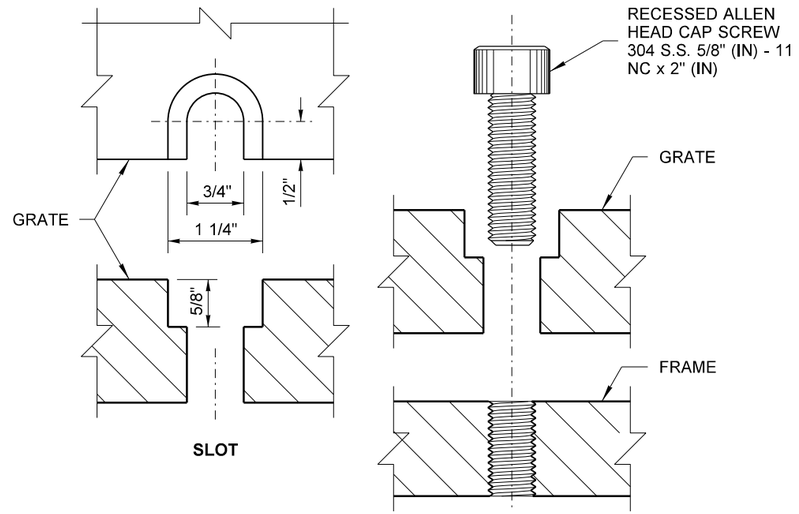
SECTION C



ISOMETRIC

NOTES

1. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 304 Stainless Steel (S.S.) 5/8" (in) - 11 NC × 2" (in) Allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.
2. Alternative reinforcing designs are acceptable in lieu of the rib design.
3. Refer to **Standard Specification Section 9-05.15(2)** for additional requirements.
4. For frame details, see **Standard Plan B-30.10.**



HOLE

BOLT-DOWN DETAILS
SEE NOTE 1

JULIE HEILMAN
STATE OF WASHINGTON
41819
REGISTERED
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RECTANGULAR SOLID METAL COVER

STANDARD PLAN B-30.20-03

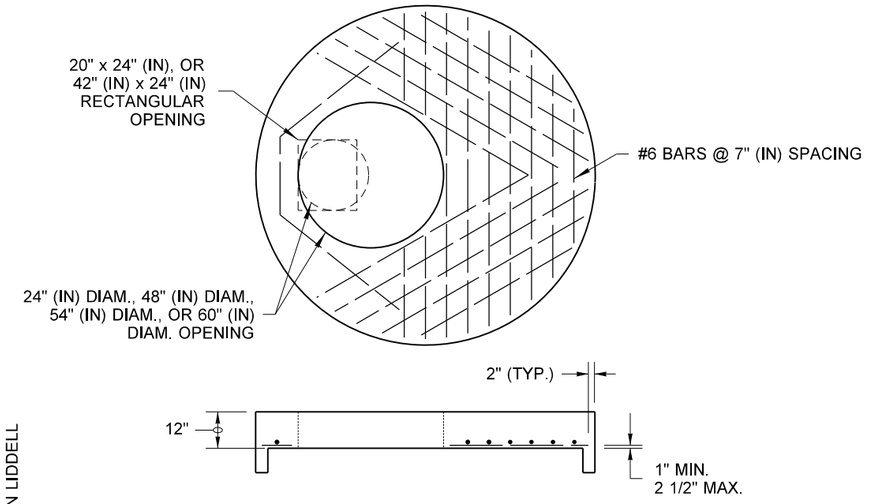
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

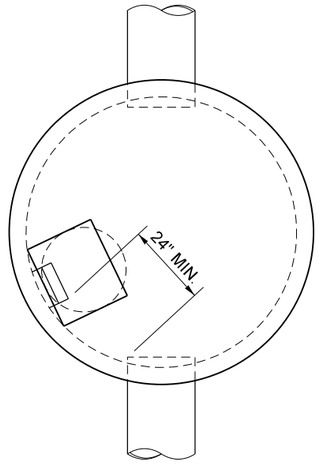
STATE DESIGN ENGINEER

Washington State Department of Transportation

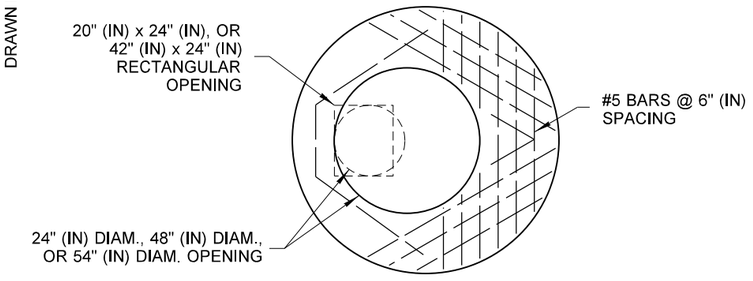
DRAWN BY: FERN LIDDELL

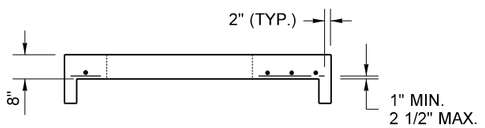


84" (IN) or 96" (IN) FLAT SLAB TOP

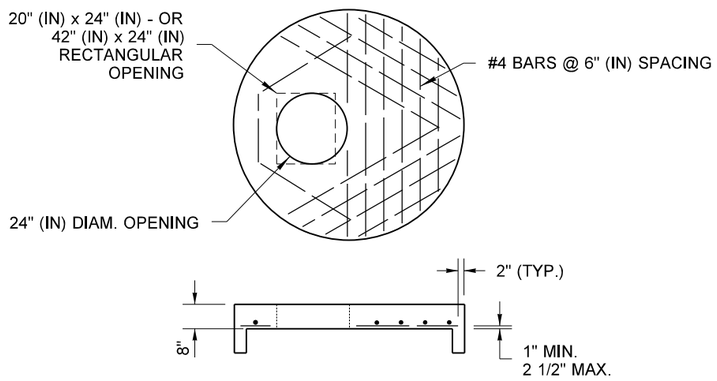


TYPICAL ORIENTATION FOR ACCESS AND STEPS

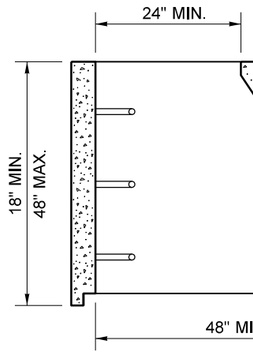




72" (IN) FLAT SLAB TOP



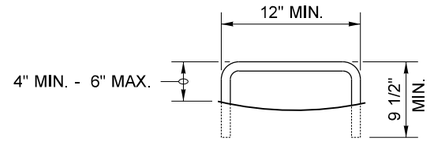
48" (IN), 54", or 60" (IN) FLAT SLAB TOP



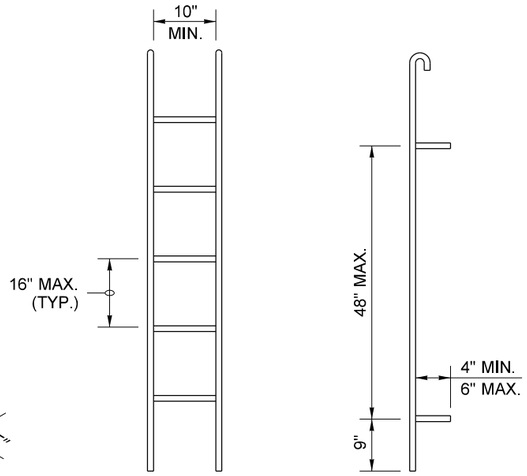
ECCENTRIC CONE SECTION

NOTE

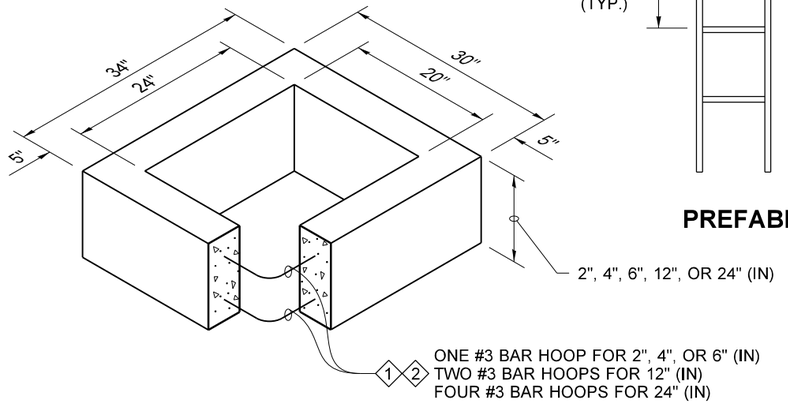
1. Ladder rungs for manholes and catch basins shall meet the requirements of **AASHTO M 199.**



STEP

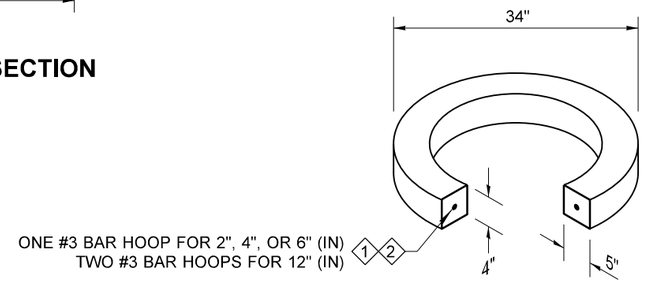


PREFABRICATED LADDER



RECTANGULAR ADJUSTMENT SECTION

1. As an acceptable alternative to rebar, wire mesh having a minimum area of 0.12 square inches per foot may be used for adjustment sections.
2. As an acceptable alternative to conventional steel reinforcment, manufacturers shall use Synthetic Structural Fibers meeting the requirements of **Standard Specification Section 9-05.50(10)**.



CIRCULAR ADJUSTMENT SECTION

For rectangular and circular adjustment sections, approved alternate material compositions are acceptable in lieu of precast concrete designs

JULIE HEILMAN
STATE OF WASHINGTON
41819
REGISTERED
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MISCELLANEOUS DETAILS FOR DRAINAGE STRUCTURES STANDARD PLAN B-30.90-02

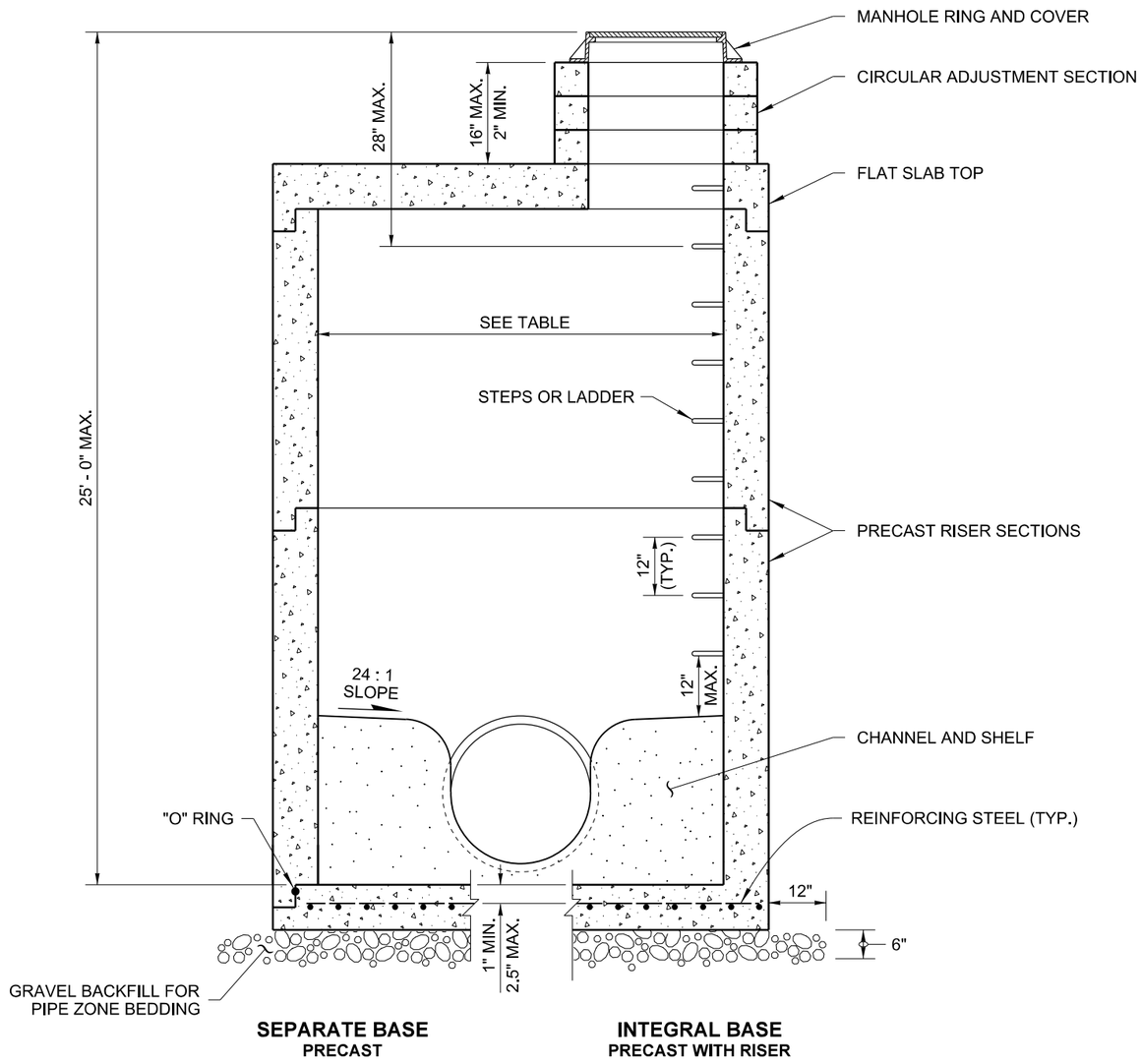
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER

Washington State Department of Transportation

DRAWN BY: LISA CYFORD



NOTES

1. Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum.
2. For pipe allowances, see **Standard Plan B-10.20.**
3. No steps are required when height is 4' (ft) or less.

MANHOLE DIMENSION TABLE				
DIAM.	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	96"	12"
144"	12"	12"	108"	12"

JULIE HEILMAN
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MANHOLE TYPE 3

STANDARD PLAN B-15.60-02

SHEET 1 OF 1 SHEET

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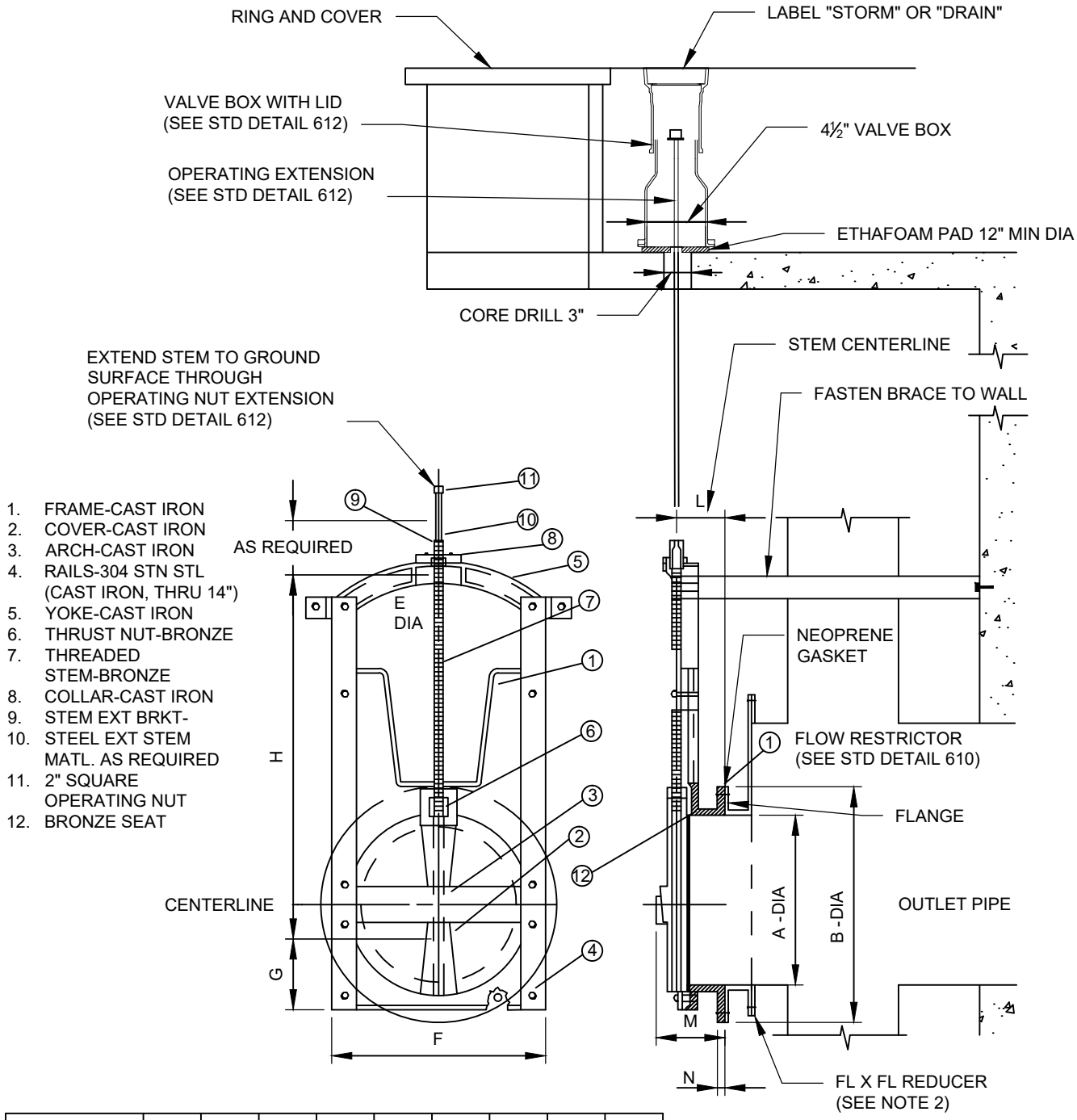
STATE DESIGN ENGINEER

Washington State Department of Transportation



1. FRAME-CAST IRON
2. COVER-CAST IRON
3. ARCH-CAST IRON
4. RAILS-304 STN STL (CAST IRON, THRU 14")
5. YOKE-CAST IRON
6. THRUST NUT-BRONZE
7. THREADED STEM-BRONZE
8. COLLAR-CAST IRON
9. STEM EXT BRKT-
10. STEEL EXT STEM MATL. AS REQUIRED
11. 2" SQUARE OPERATING NUT
12. BRONZE SEAT

	A	B	E	F	G	H	L	M	N
DIMENSIONS (IN INCHES)	8	11 ¾	⅞	11 ⅛	5 ½	17 ⅝	4 1/2	7	¾

NOTES:

1. AWWA C509 RESILIENT SEATED GATE VALVE MAY BE SUBSTITUTED FOR STORMWATER VALVE PER ENGINEER'S APPROVAL.
2. CONSTRUCT FLOW RESTRICTOR TO ACCOMMODATE 8" FLANGE CONNECTION FOR VALVE. MAY USE 8" X OUTLET PIPE DIAMETER FLANGED REDUCER OR ACCEPTED EQUIVALENT.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

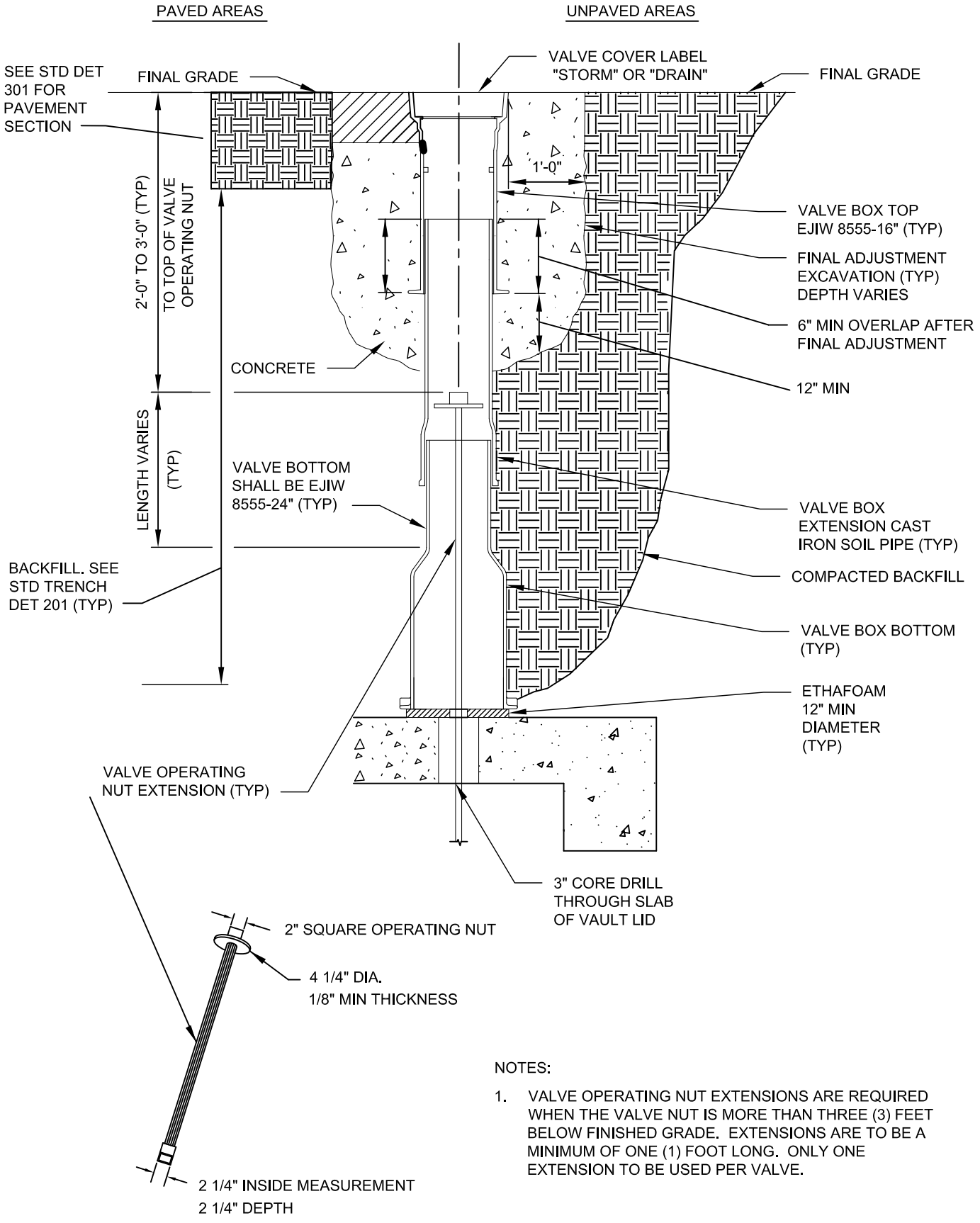
CityofRedmond
WASHINGTON

STANDARD DETAILS

STORMWATER GATE VALVE

FILE NAME: SD611.DWG

DETAIL NUMBER: 611



NOTES:

1. VALVE OPERATING NUT EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS MORE THAN THREE (3) FEET BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG. ONLY ONE EXTENSION TO BE USED PER VALVE.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

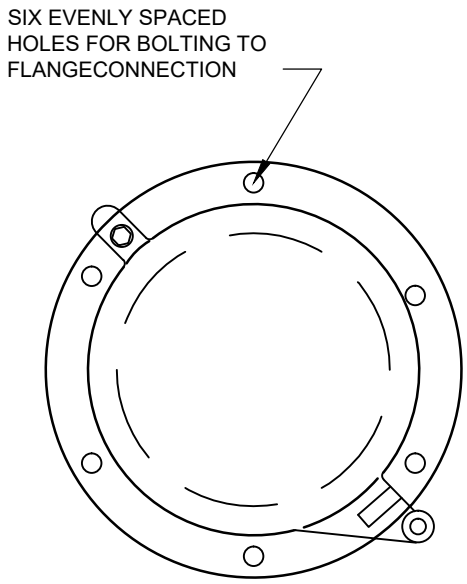
CityofRedmond
WASHINGTON

STANDARD DETAILS

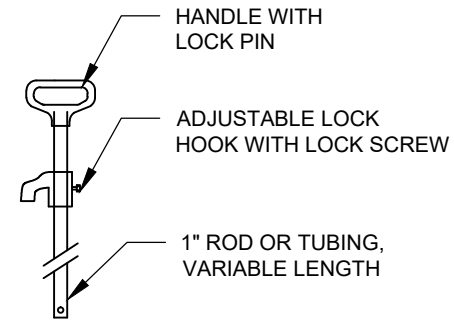
STORMWATER GATE VALVE BOX AND EXTENSION

FILE NAME: SD612.DWG

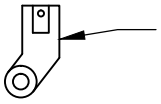
DETAIL NUMBER: **612**



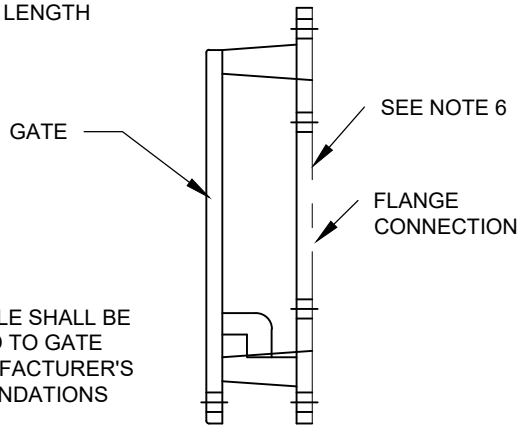
FRONT
NTS



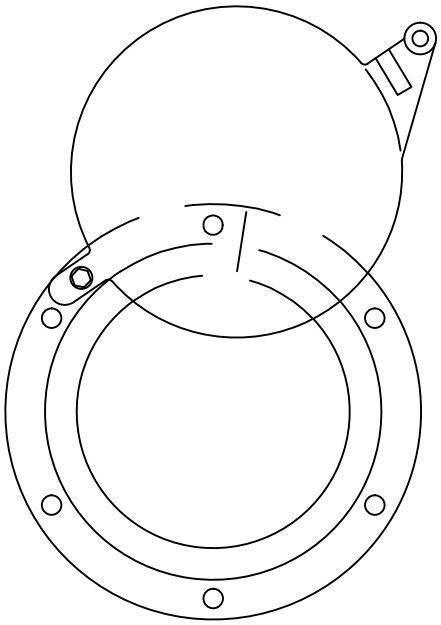
LIFT ROD
NTS



LIFT HANDLE CONNECTOR
NTS



SIDE VIEW
NTS



MAXIMUM OPENING
OF GATE

NOTES:

1. SHEAR GATE SHALL BE ALUMINUM ALLOY PER ASTM B-26-ZG-32A AS REQUIRED.
2. GATE SHALL BE 8 INCH DIAMETER FOR PIPE 12 INCHES OR LESS IN DIAMETER, 12 INCH DIAMETER FOR PIPES GREATER THAN 12 INCHES.
3. GATE SHALL BE JOINED TO TEE SECTION BY BOLTING THROUGH FLANGE.
4. LIFT ROD: AS SPECIFIED BY MFR. WITH HANDLE EXTENDING TO WITHIN ONE FOOT OF COVER AND ADJUSTABLE HOOK LOCK FASTENED TO STANDOFF AS DESCRIBED IN STD DETAIL 610.
5. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.
6. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE, STOP TAB, OR SOME OTHER DEVICE.
7. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 3/8 INCH DIAMETER STAINLESS STEEL.
9. ALTERNATE SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS ABOVE.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

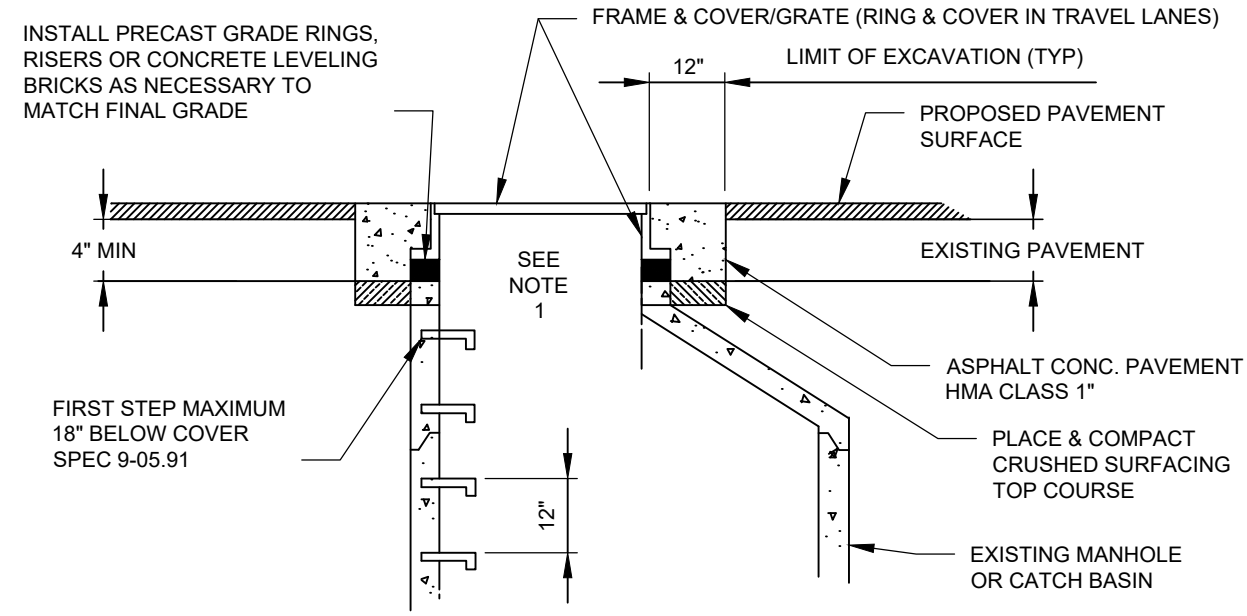
CityofRedmond
WASHINGTON

STANDARD DETAILS

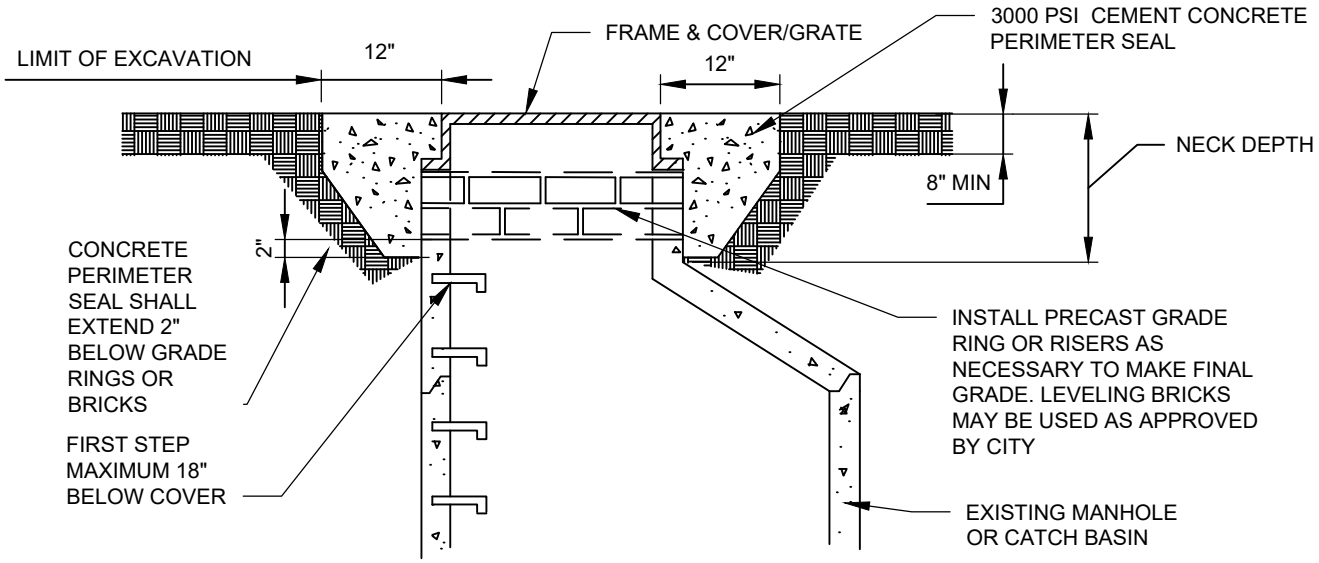
STORMWATER
SHEAR GATE

FILE NAME: SD613.DWG

DETAIL NUMBER: 613



PAVED AREAS
NTS



UNPAVED AREAS
NTS

NOTES:

1. WHERE DEPTH OF NECK EXCEEDS 24 INCHES, ADJUST MANHOLE/CATCH BASIN TO GRADE BY INSERTING NEW BARREL SECTION BETWEEN THE CONE/SLAB AND EXISTING BARREL.
2. GRADE RINGS, CONCRETE RISERS AND CONCRETE BRICK SHALL BE SET IN ¾ INCH NON-SHRINK GROUNT, PLASTER SMOOTH INSIDE AND OUT.
3. STEPS OR HAND HOLDS SHALL BE ADDED AS NEEDED, PER SPEC 9-05.21. DO NOT HANG A LADDER FROM THE TOP STEP.
4. PRECAST GRADE RINGS AND RISERS MUST BE CAST WITH GROOVE TO ALLOW FIELD INSTALLATION OF SAFETY STEP.
5. REPLACE EXISTING FRAME AND COVER/GRATE IF NON-STANDARD OR WORN. IF STRUCTURE IS IN TRAVEL LANE, REPLACE FRAME AND GRATE WITH RING AND COVER. SEE STD DETAIL 631.
6. GROUT INSIDE AND OUTSIDE OF MANHOLE/CATCH BASIN NECK TO achieve WATER TIGHT CONSTRUCTION. FINISH SMOOTH THE INSIDE OF THE NECK. USE NON-SHRINK GROUT ONLY.
7. LOCKING RING AND COVERS ARE REQUIRED IN ALL UNPAVED AREAS AND EASEMENTS. LOCKING RING AND COVER SHALL CONFORM TO STANDARD SPEC 9-05.15(1).

Gary M. Schimek

NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

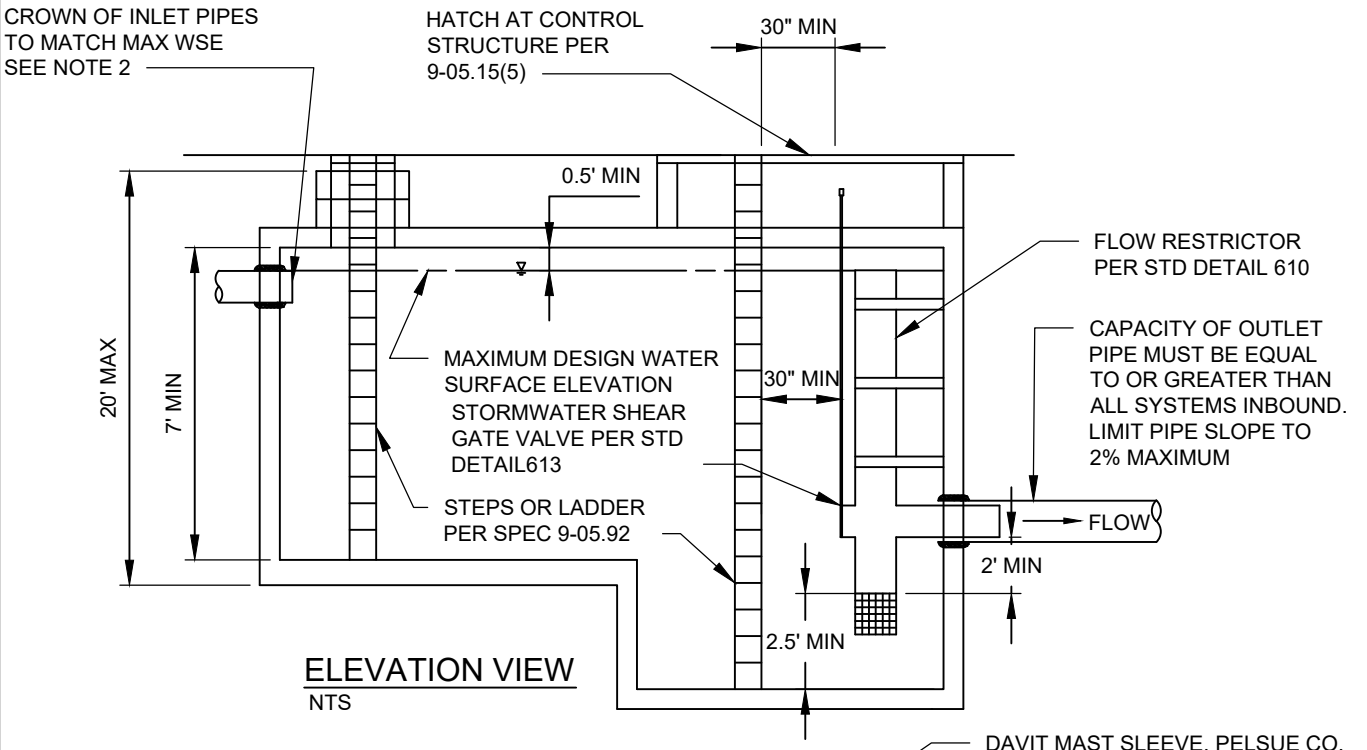
CityofRedmond WASHINGTON

STANDARD DETAILS

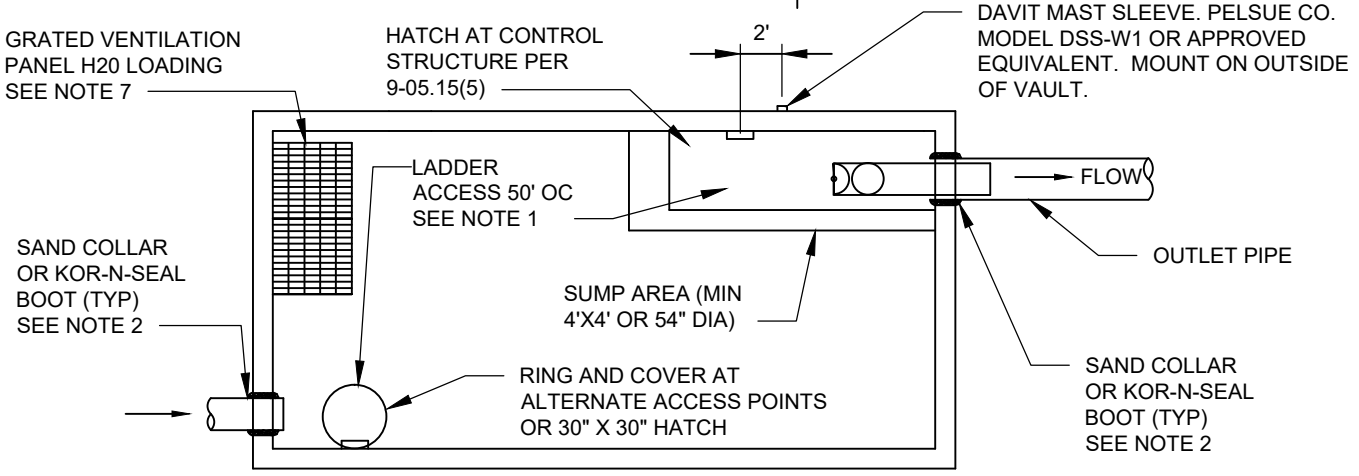
STORMWATER MANHOLE/CATCH BASIN ADJUSTMENT DETAIL

FILE NAME: SD615.DWG

DETAIL NUMBER: 615



ELEVATION VIEW
NTS



PLAN VIEW
NTS

NOTES:

1. PROVIDE LADDER RUNGS (SPEC 9-05.92) IMMEDIATELY ADJACENT TO ALL INLET/OUTLET PIPES.
2. APPLY NON-SHRINK GROUT TO INSIDE AND OUTSIDE OF ALL JOINTS, RINGS, RISERS AND FRAMES.
3. ALL PIPES SHALL BE PERPENDICULAR TO FACE OF VAULT.
4. PENETRATE CARRIER PIPE THROUGH VAULT WALL.
5. SLIP SMOOTH-BORE HORIZONTAL LEG OF FLOW CONTROL TEE INSIDE CARRIER PIPE.
6. HATCH OVER CONTROL STRUCTURE SHALL BE MINIMUM 36" X 72" AND LARGE ENOUGH TO BE OVER CONTROL STRUCTURE LADDER ACCESS AND SUMP.
7. GRATED VENTILATION PANEL MAY BE COMBINED WITH LADDER ACCESS POINT WITH STORMWATER ENGINEER APPROVAL.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

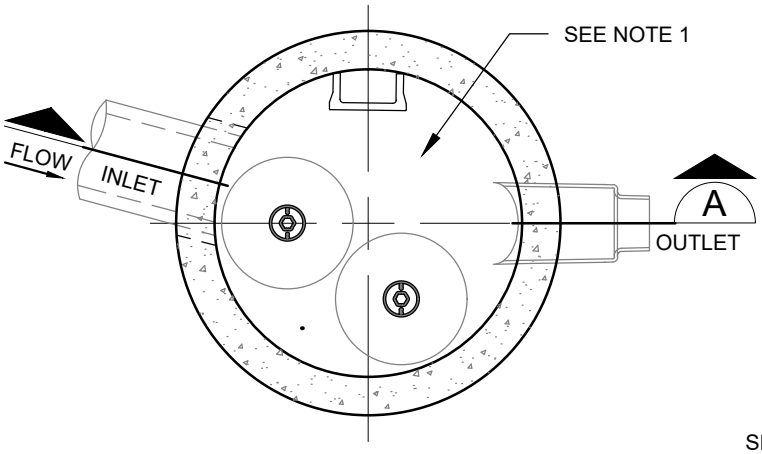
CityofRedmond
WASHINGTON

STANDARD DETAILS

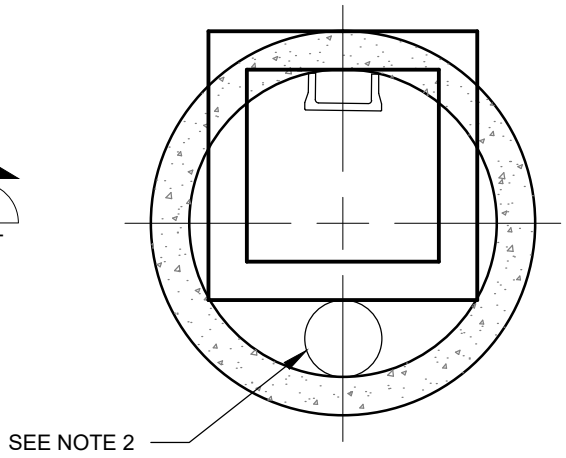
DETENTION VAULT ACCESS MANHOLE LID OVER LOW POINT

FILE NAME: SD616.DWG

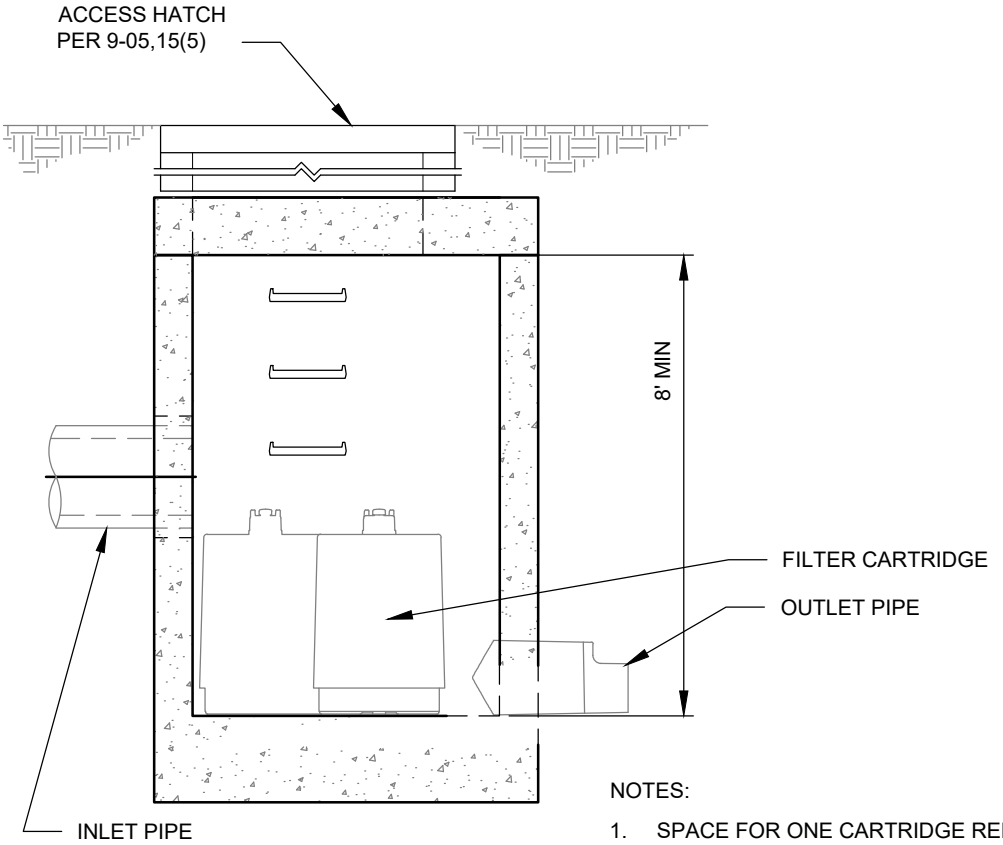
DETAIL NUMBER: 616



INTERIOR PLAN
NTS



ACCESS PLAN
NTS



SECTION A
NTS

NOTES:

1. SPACE FOR ONE CARTRIDGE REMOVED AND LEFT OPEN PERMANENTLY FOR MAINTENANCE ACCESS. SYSTEM SIZED TO TREAT SERVICE AREA WITHOUT "REMOVED" CARTRIDGE.
2. 12 INCH CLEANOUT OVER OUTLET PIPE IF IT IS NOT BELOW HATCH OPENING.
3. THE 8 FOOT MINIMUM CLEARANCE CAN BE REDUCED IF ACCESS HATCHES ARE PROVIDED ABOVE ALL FILTERS.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

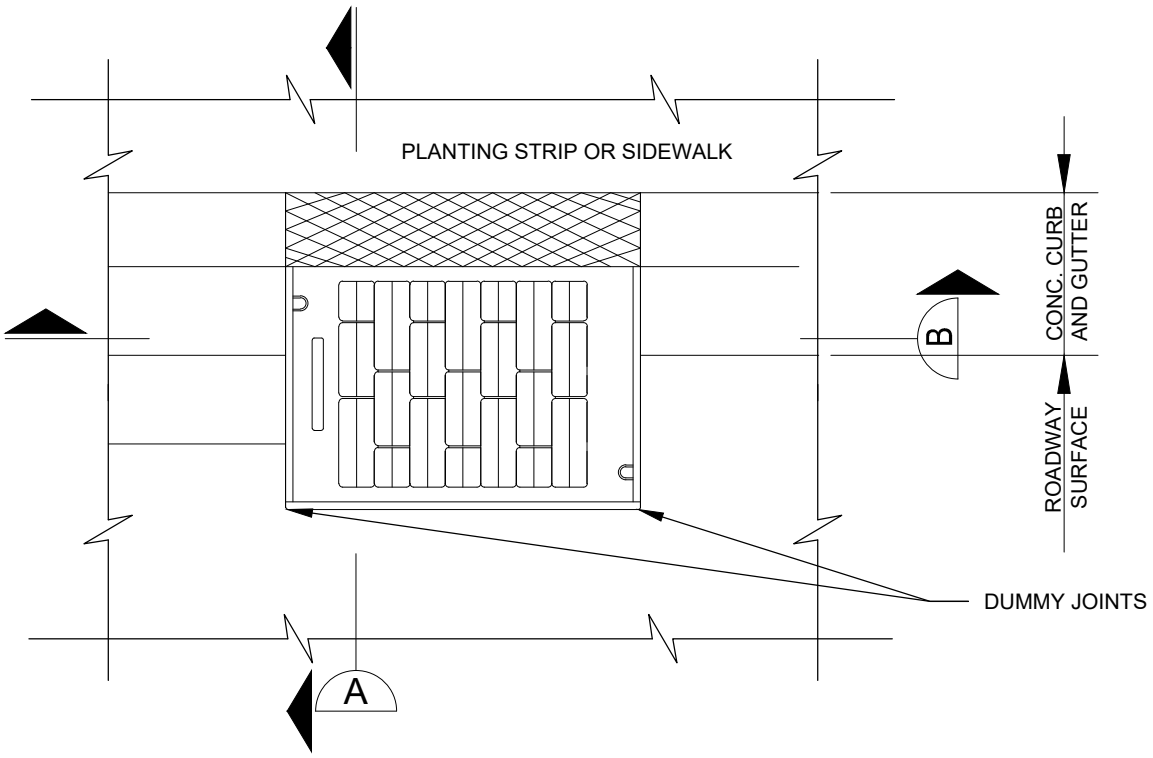
REVISION DATE: MARCH 01, 2017

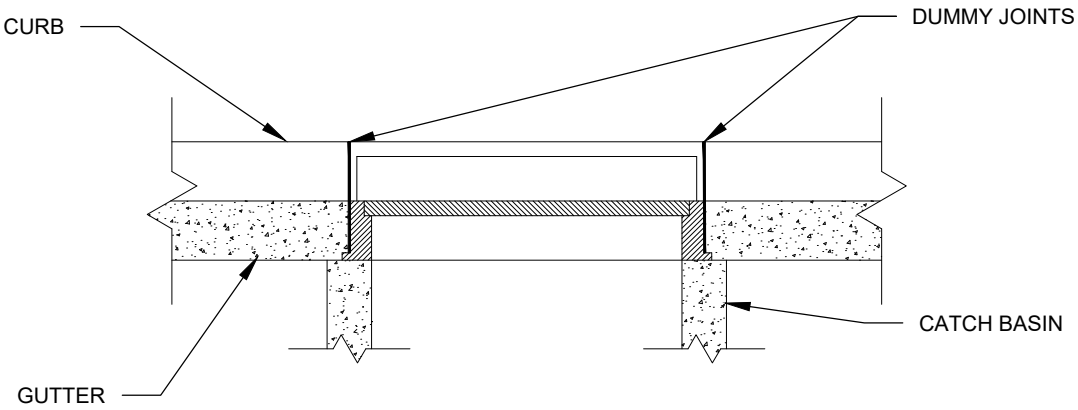
CityofRedmond
WASHINGTON

STANDARD DETAILS

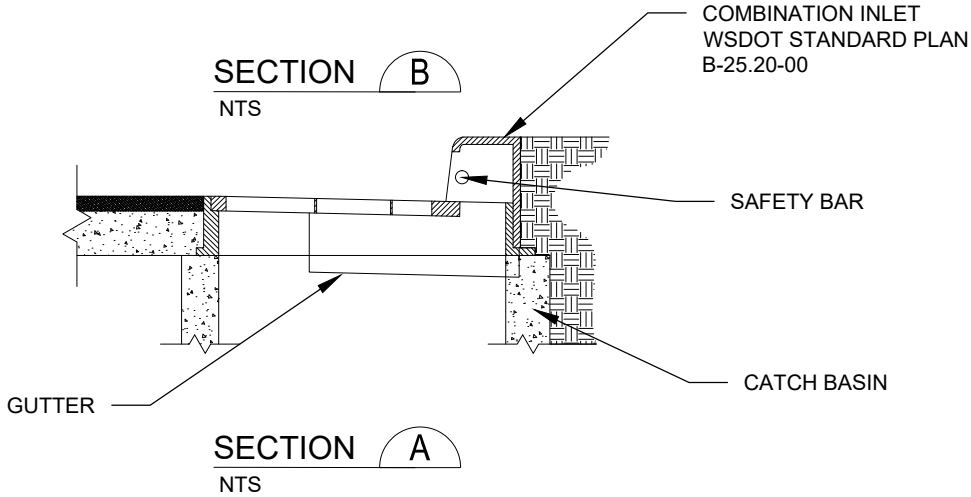
FILTER VAULT ACCESS

FILE NAME: SD617A.DWG | DETAIL NUMBER: 617A





SECTION B
NTS



SECTION A
NTS

NOTES:

1. SET TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
2. SEE DETAIL NUMBER: 303 FOR JOINT REQUIREMENTS.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

CityofRedmond
WASHINGTON

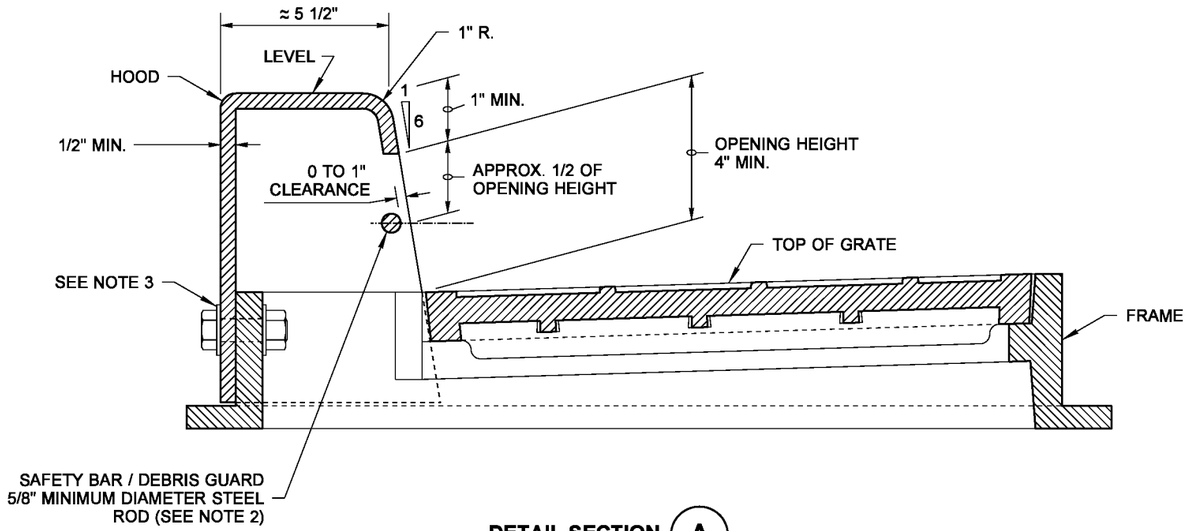
STANDARD DETAILS

THRU CURB INLET FRAME AND GRATE WITH VERTICAL CURB INSTALLATION

FILE NAME: SD618.DWG

DETAIL NUMBER: 618

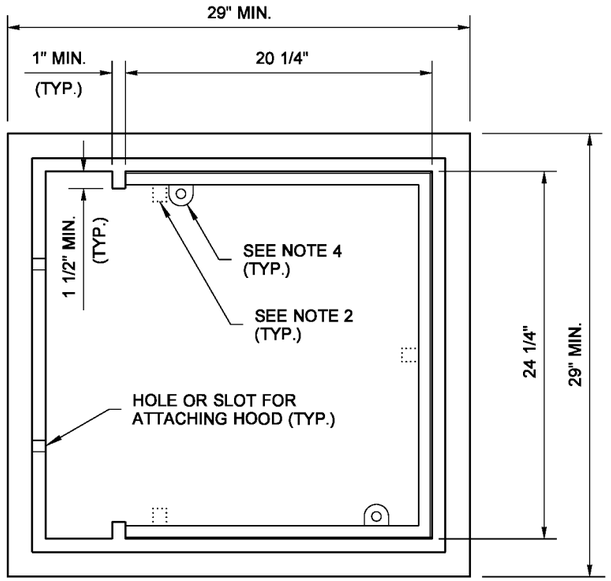
DRAWN BY: FERN LIDDELL



DETAIL SECTION (A)

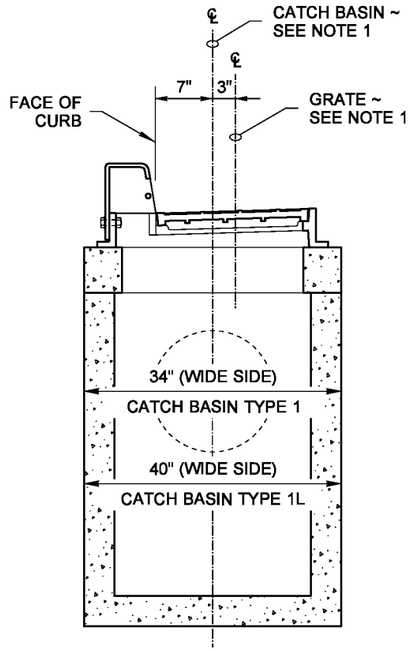
NOTES

1. This inlet requires the precast catch basin unit to be rotated 90 degrees so that the narrow side is parallel to the curb line. When calculating offsets from curb to CL of the precast catch basin, please note that the CL of the grate is not the CL of the precast catch basin. See **Section A**
2. The dimensions of the frame and hood may vary slightly among different manufacturers. The Frame may have cast features intended to support a debris guard. Hood units may be mounted inside or outside of the frame. The methods for fastening the safety bar / debris guard rod to the hood may vary. The hood may include casting lugs. The top of the hood may be cast with a pattern.
3. Attach the hood to the frame with two 3/4" × 2" hex head bolts, nuts, and oversize washers. The washers shall have diameters adequate to ensure full bearing across the slots.
4. Bolt-down capability is required on all frames, grates and covers, unless specified in the Contract. Provide two holes in the Frame that are vertically aligned with the grate slots. The frame shall accept the 5/8" × 11 NC × 2" allen head cap screw by being tapped, or other approved mechanism. The location of bolt-down holes varies among manufacturers. See BOLT-DOWN DETAIL, **Standard Plan B-30.10.**
5. Only ductile iron Vaned Grates shall be used. See **Standard Plans B-30.30 and B-30.40** for grate details. Refer to **Standard Specification 9-05.15(2)** for additional requirements.
6. This plan is intended to show the installation details of a manufactured product. This plan is not intended to show the specific details necessary to fabricate the castings depicted in this drawing.

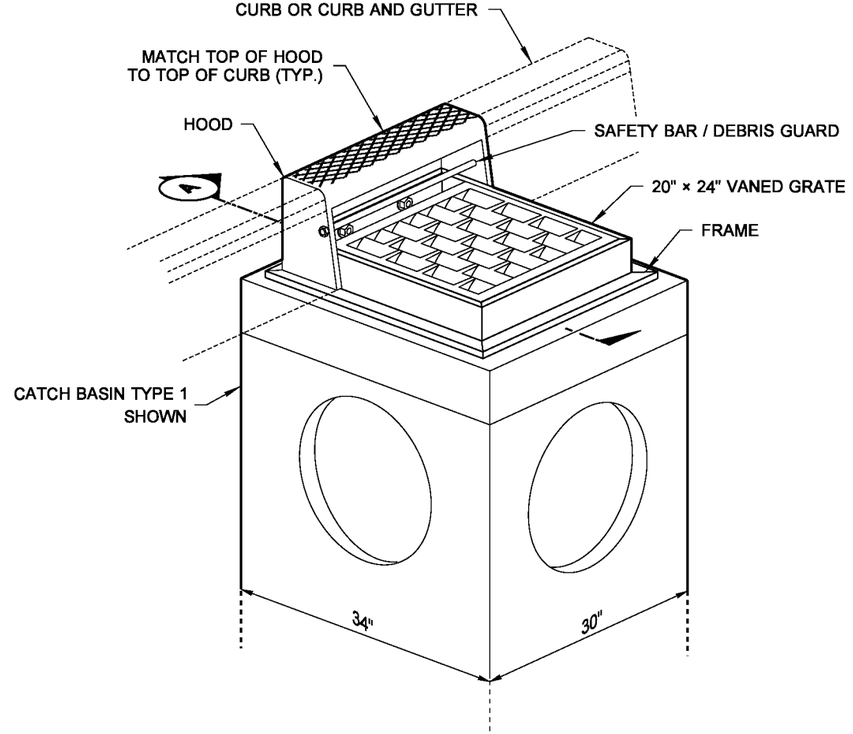


TOP VIEW

FRAME DETAIL



SECTION (A)



ISOMETRIC VIEW

COMBINATION INLET
FRAME, HOOD, AND VANED GRATE

CASEY M. KRAMER
STATE OF WASHINGTON
44535
REGISTERED
PROFESSIONAL ENGINEER

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

COMBINATION INLET

STANDARD PLAN B-25.20-01

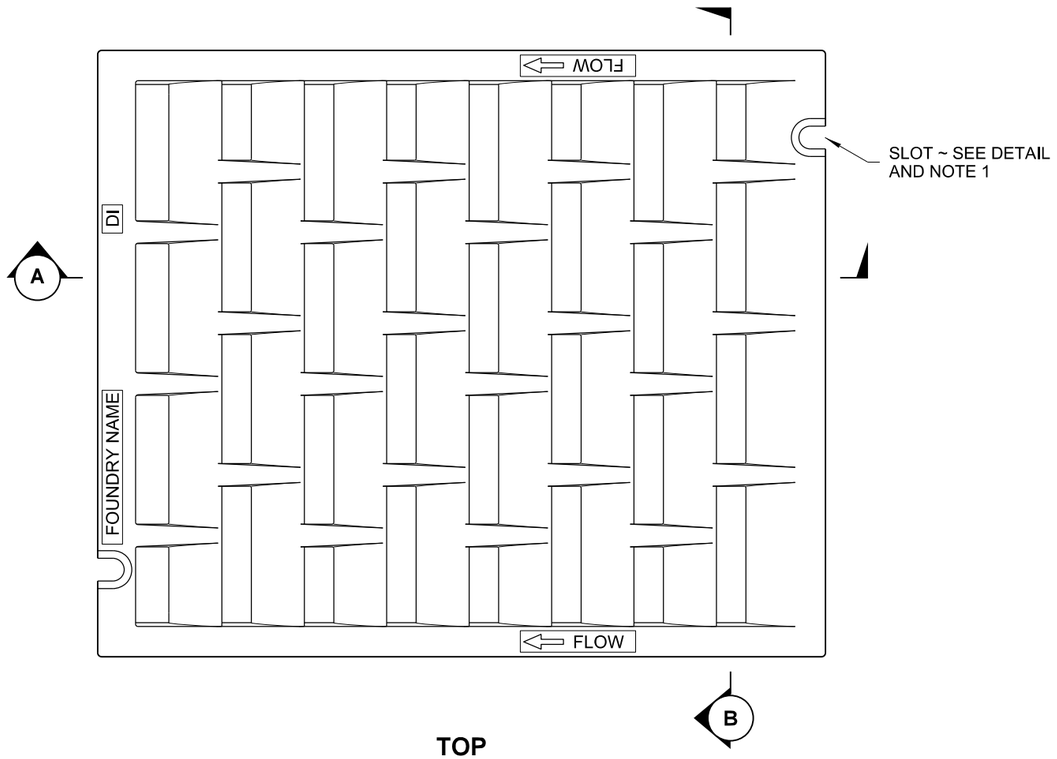
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

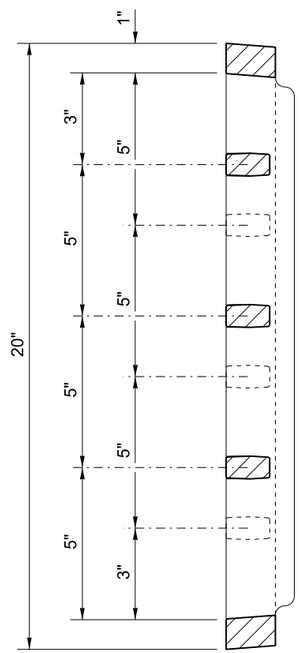
Pasco Bakotich III — STATE DESIGN ENGINEER

03-15-12 — DATE

Washington State Department of Transportation



TOP

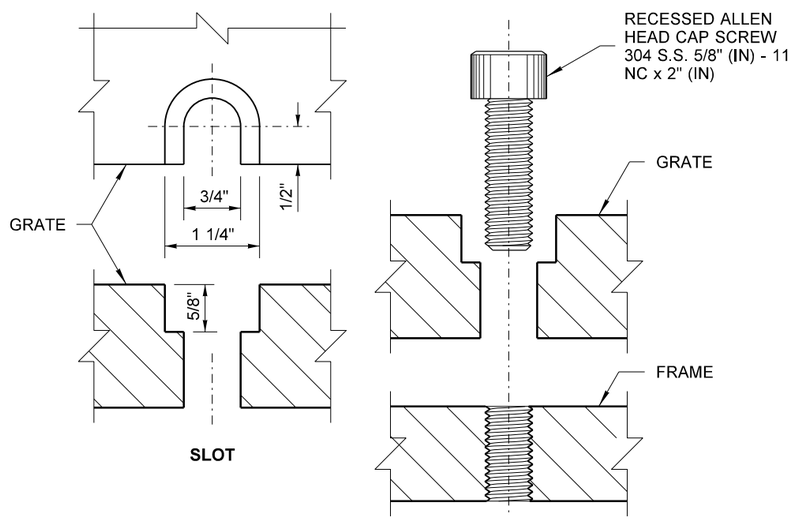


SECTION B

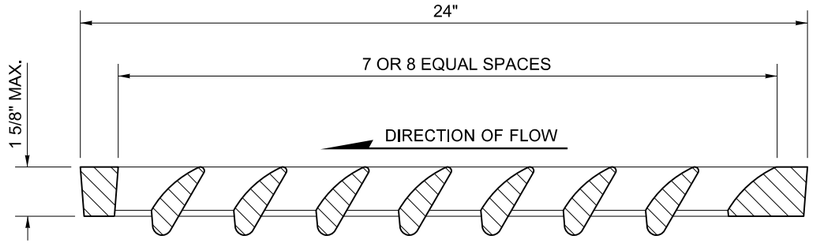
DRAWN BY: FERN LIDDELL

NOTES

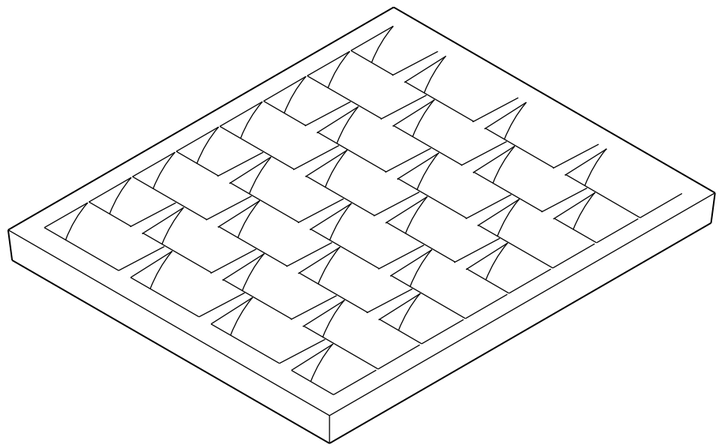
1. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 304 Stainless Steel (S.S.) 5/8" (in) - 11 NC × 2" (in) Allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.
2. Refer to **Standard Specification Section 9-05.15(2)** for additional requirements.
3. For frame details, see **Standard Plan B-30.10**.



BOLT-DOWN DETAILS
SEE NOTE 1



SECTION A



ISOMETRIC

JULIE HEILMAN
STATE OF WASHINGTON
41819
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PROFESSIONAL ENGINEER

RECTANGULAR VANED GRATE

STANDARD PLAN B-30.30-02

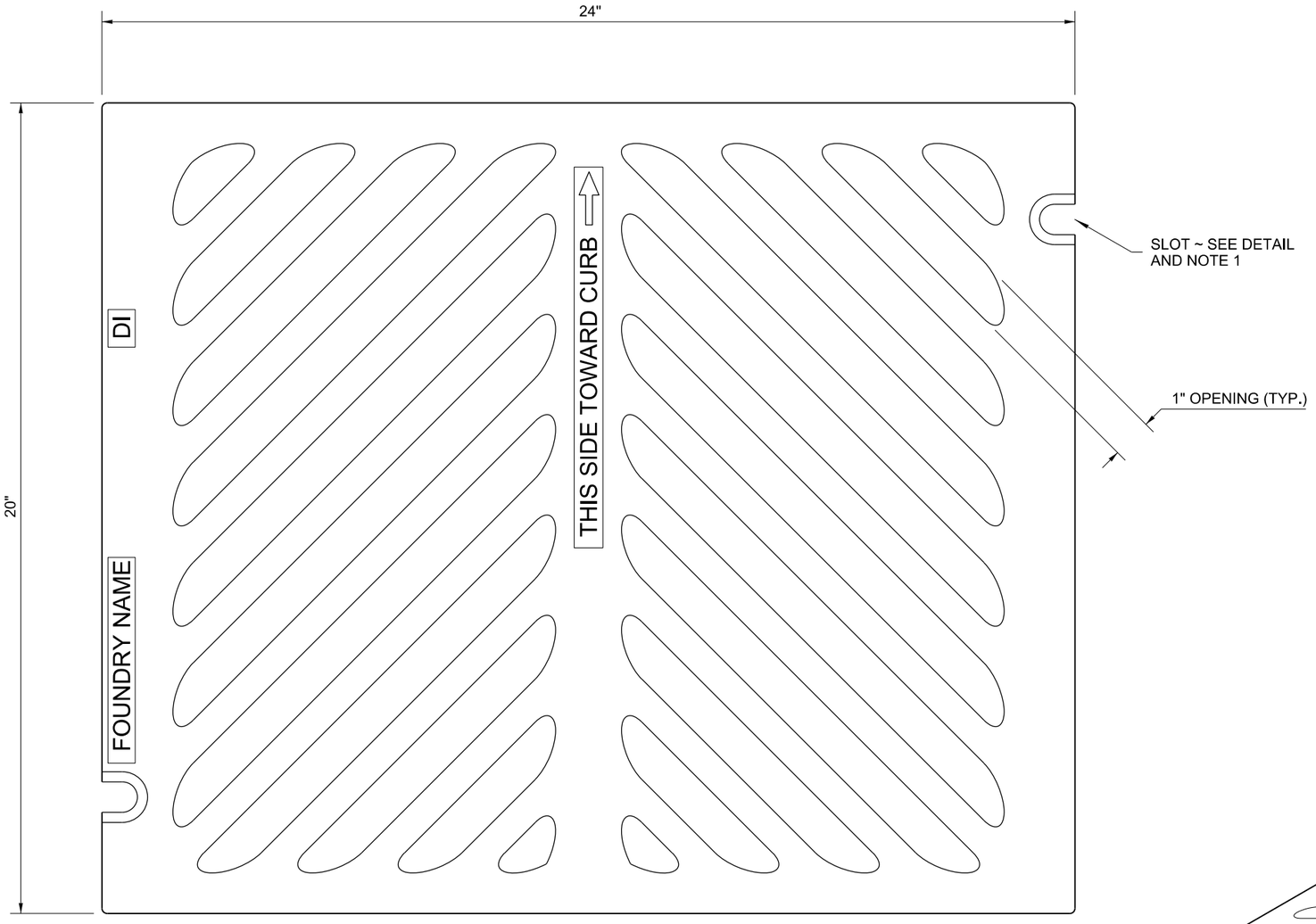
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER

Washington State Department of Transportation

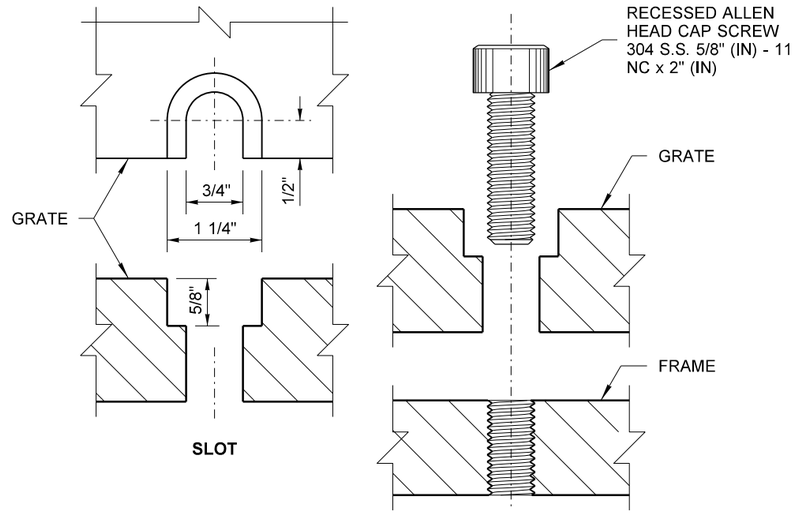
DRAWN BY: FERN LIDDELL



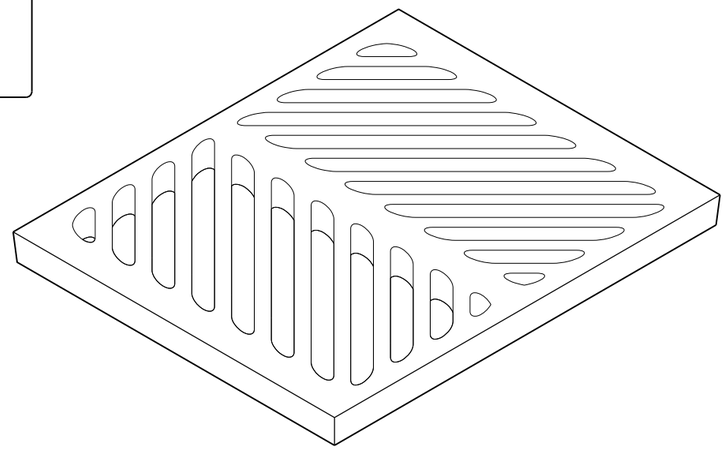
TOP

NOTES

1. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 304 Stainless Steel (S.S.) 5/8" (in) - 11 NC × 2" (in) Allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.
2. Refer to **Standard Specification section 9-05.15(2)** for additional requirements.
3. For frame details, see **Standard Plan B-30.10**.
4. The thickness of the grate shall not exceed 1 5/8" (in).



BOLT-DOWN DETAILS
SEE NOTE 1



ISOMETRIC

JULIE HEILMAN
STATE OF WASHINGTON
41819
REGISTERED
PROFESSIONAL ENGINEER

RECTANGULAR HERRINGBONE GRATE

STANDARD PLAN B-30.50-02

SHEET 1 OF 1 SHEET

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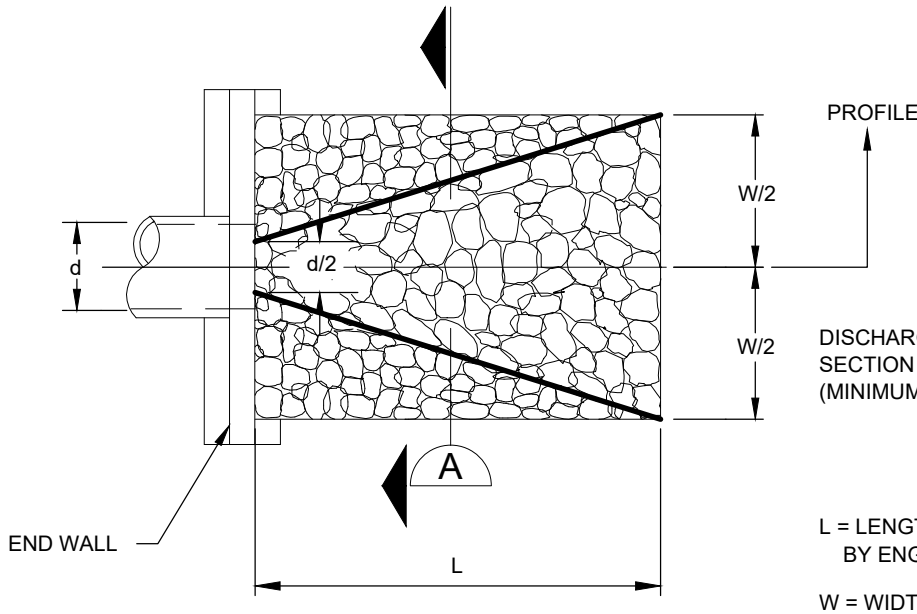
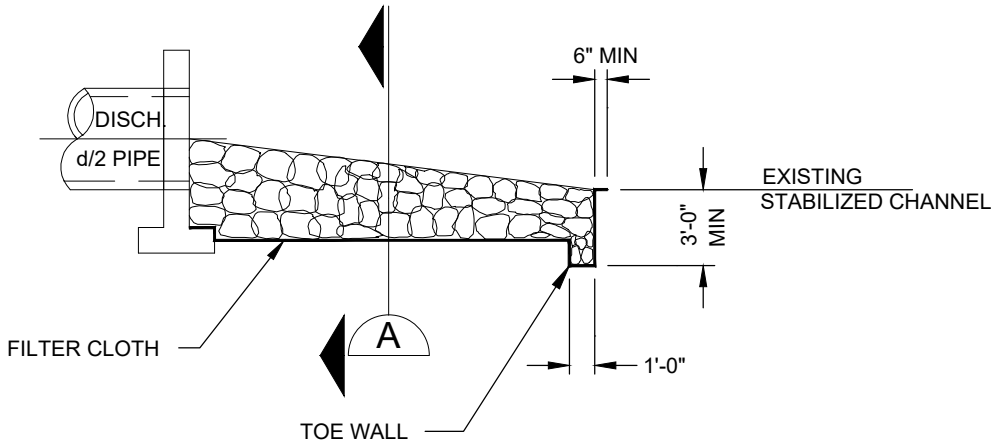
STATE DESIGN ENGINEER

Washington State Department of Transportation



PLAN VIEW

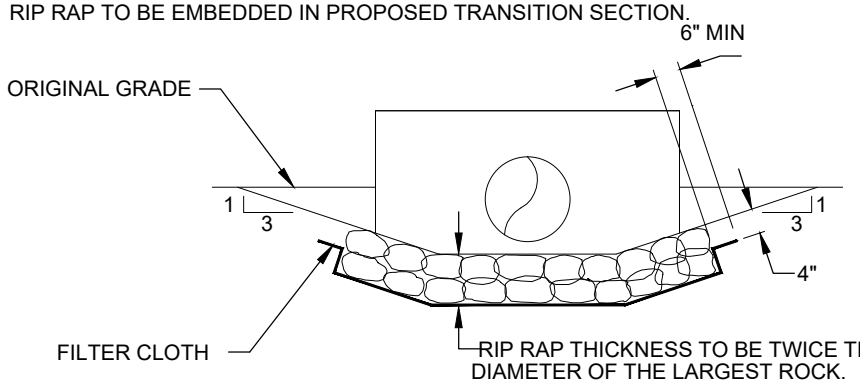
NTS



ELEVATION VIEW

NTS

RIP RAP TO BE EMBEDDED IN PROPOSED TRANSITION SECTION.



SECTION A

NTS

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

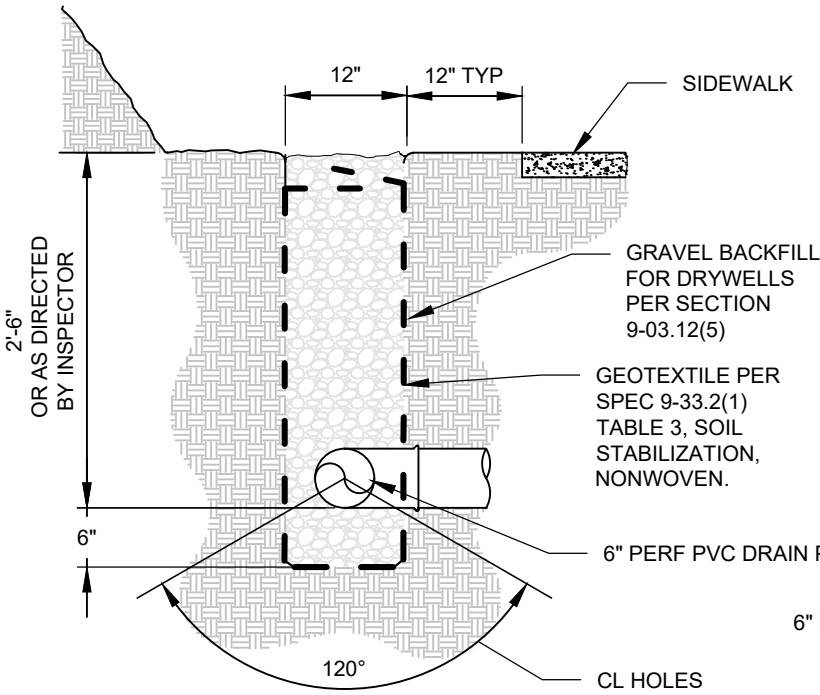
CityofRedmond
WASHINGTON

STANDARD DETAILS

HEAD WALL AND RIP RAP

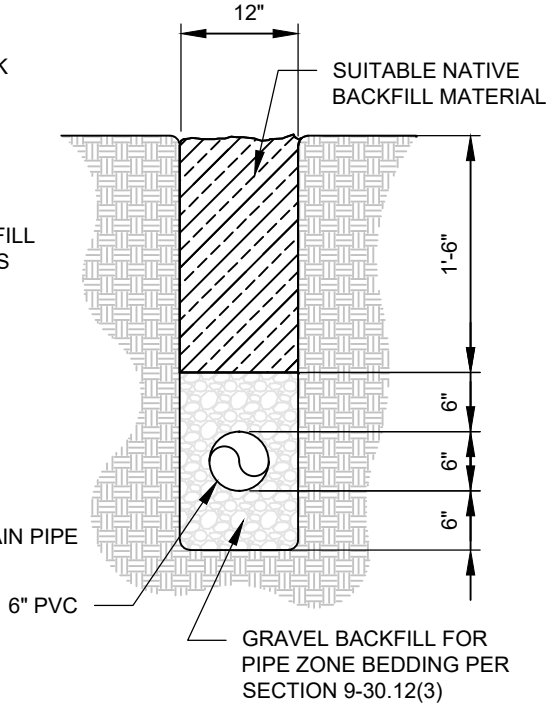
FILE NAME: SD620.DWG

DETAIL NUMBER: 620



PERF-DRAIN

NTS



TIGHT-LINE

NTS

NOTES:

1. SEE DETAIL 623 FOR STORMWATER CLEANOUT DETAIL

Gary M. Schimek

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REVISION DATE: MARCH 01, 2018

CityofRedmond
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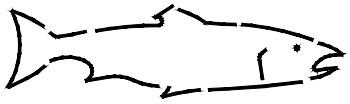
STANDARD DETAILS

LOT DRAIN TRENCH

FILE NAME: SD621.DWG

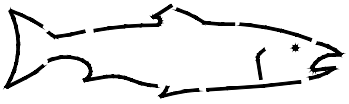
DETAIL NUMBER: 621

DUMP NO WASTE



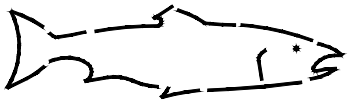
DRAINS TO LAKE

ONLY RAIN



DOWN THE DRAIN

DUMP NO WASTE



DRAINS TO STREAM

DUMP NO WASTE

PROTECT YOUR

GROUND WATER

NOTES:

1. 2" LETTERS IN TRAFFIC WHITE, STENCIL SIZE 20" X 27"
2. STENCILS ARE AVAILABLE AT THE STORM WATER CONSTRUCTION DIVISION.
3. ALL STORM DRAINAGE CONSTRUCTION SHALL REQUIRE STENCILING PAVED SURFACE AREA NEAR CATCH BASIN.

STENCILING DETAIL

NTS

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

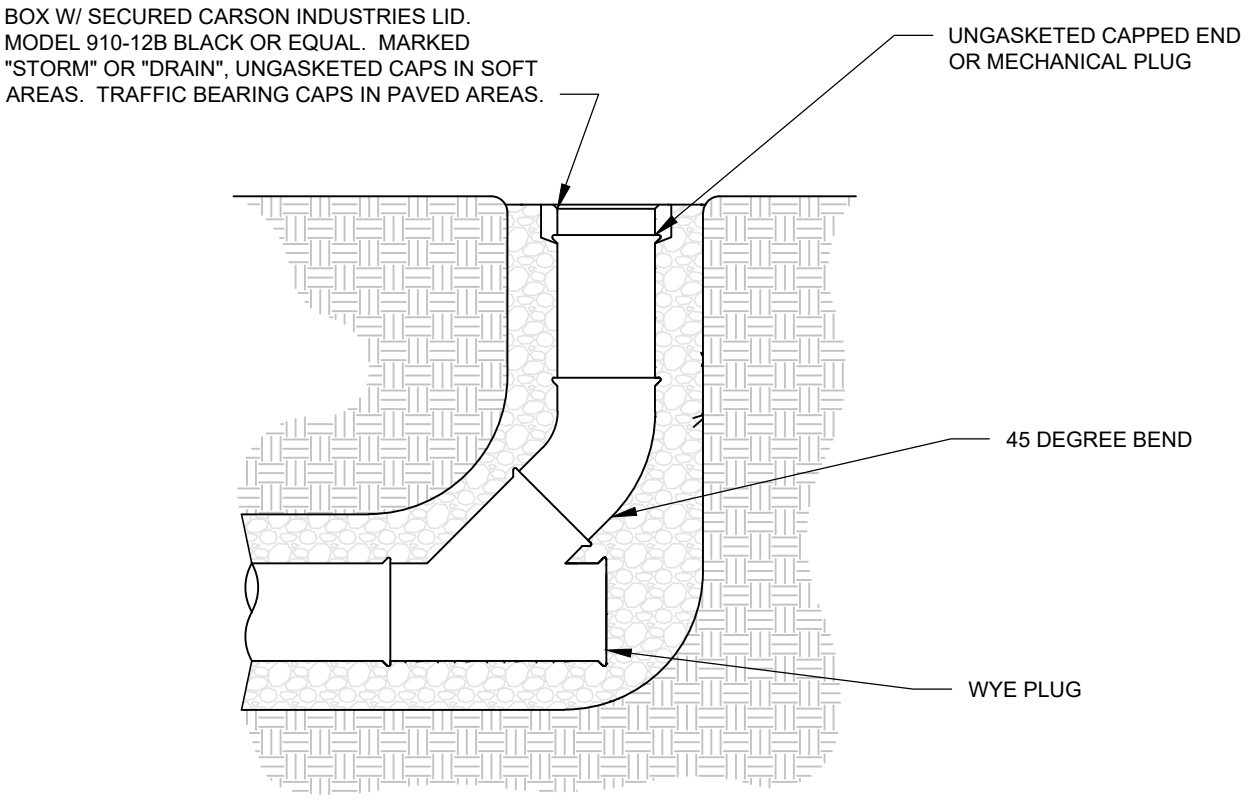
CityofRedmond
WASHINGTON

STANDARD DETAILS

STENCILING DETAIL

FILE NAME: SD622.DWG

DETAIL NUMBER: 622



CLEANOUT

NTS

NOTES:

1. LATERALS TO LOTS: WYE TO LOT CAP AND MARK LOCATION WITH 2"X4" POST MARKED "STORM".
2. CLEANOUT LOCATIONS TO BE AT BENDS, END OF LINES AND AT 100' OC MAX SPACING.

Gary M. Schimek

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NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

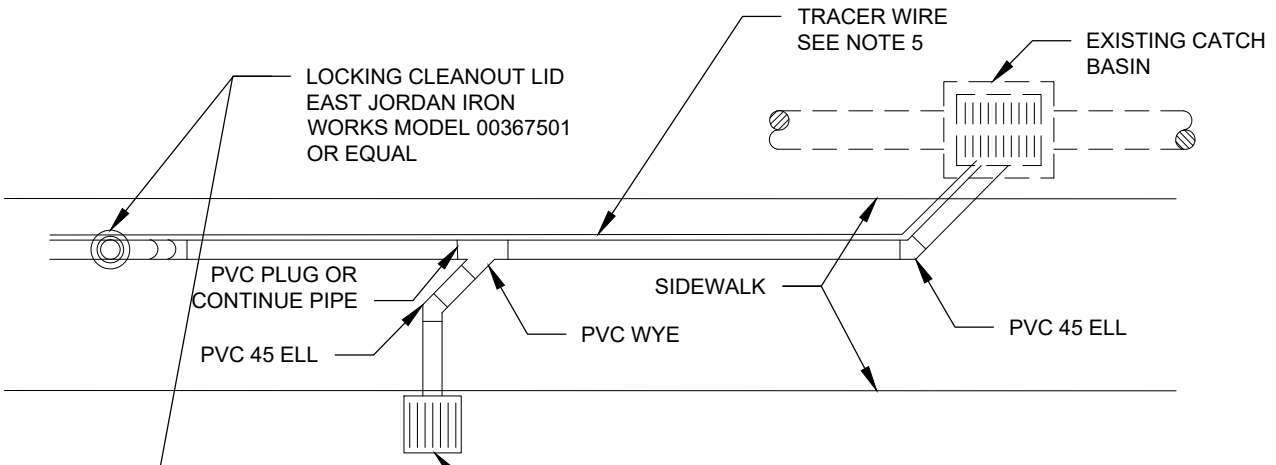
CityofRedmond WASHINGTON

STANDARD DETAILS

STORMWATER CLEANOUT

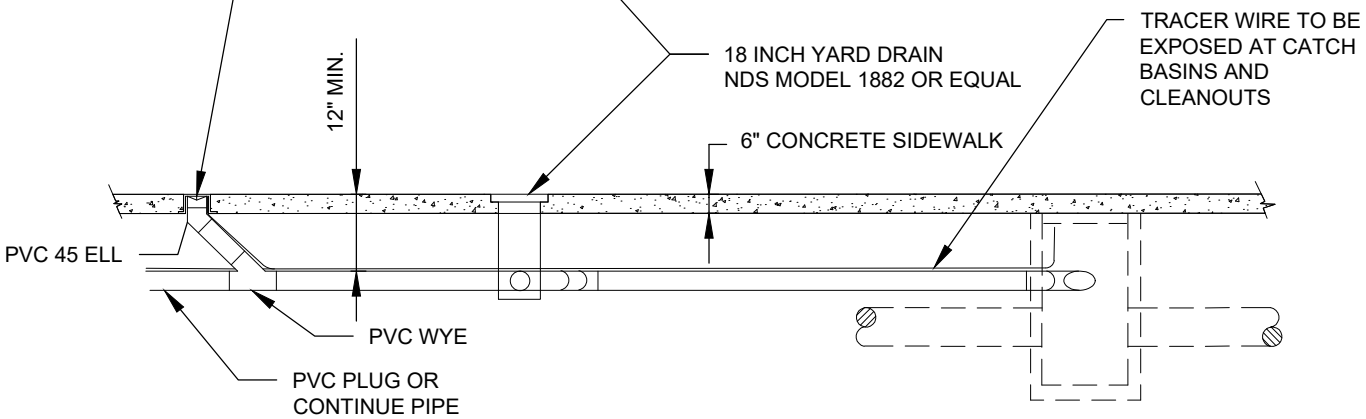
FILE NAME: SD623.DWG

DETAIL NUMBER: 623



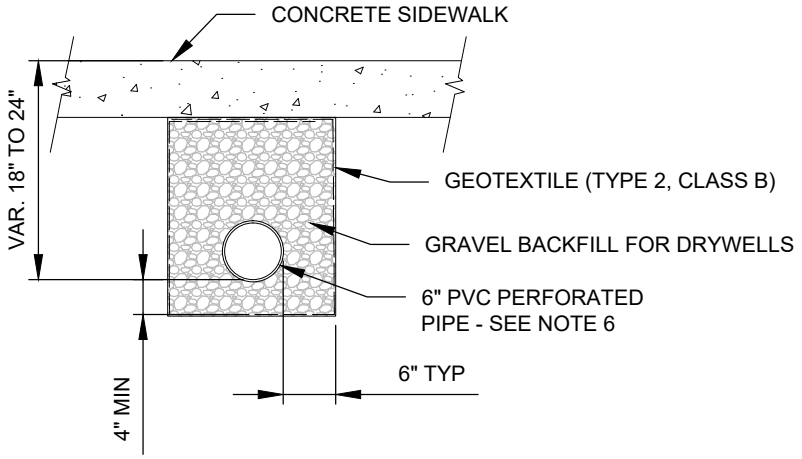
PLAN VIEW

NTS



PROFILE VIEW

NTS



TYPICAL SECTION

NTS

NOTES:

1. MAXIMUM DISTANCE BETWEEN PIPE CLEANOUTS OR YARD DRAINS SHALL BE 100 FEET.
2. FOR NEW CONSTRUCTION, LOCATE YARD DRAINS NEAR PROPERTY LINES. YARD DRAINS MAY BE SHARED BY TWO PROPERTIES.
3. FOR RETROFITS, LOCATE YARD DRAINS AND LIMITS OF SIDEWALK REPLACEMENT AS DIRECTED BY INSPECTOR. REMOVE SIDEWALK TO EXISTING EXPANSION JOINTS.
4. PROTECT ADJACENT WALLS, VEGETATION, DRIVEWAYS, AND OTHER FEATURES.
5. TRACER WIRE TO BE SOLID WIRE 12 GA., AND SHALL BE PLACED FROM START OF RUN AT FIRST MANHOLE TO THE END OF THE UNDERDRAIN.
6. UNDERDRAIN TO BE PERFORATED SCHEDULE 20 PVC.

Gary M. Schimek

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NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

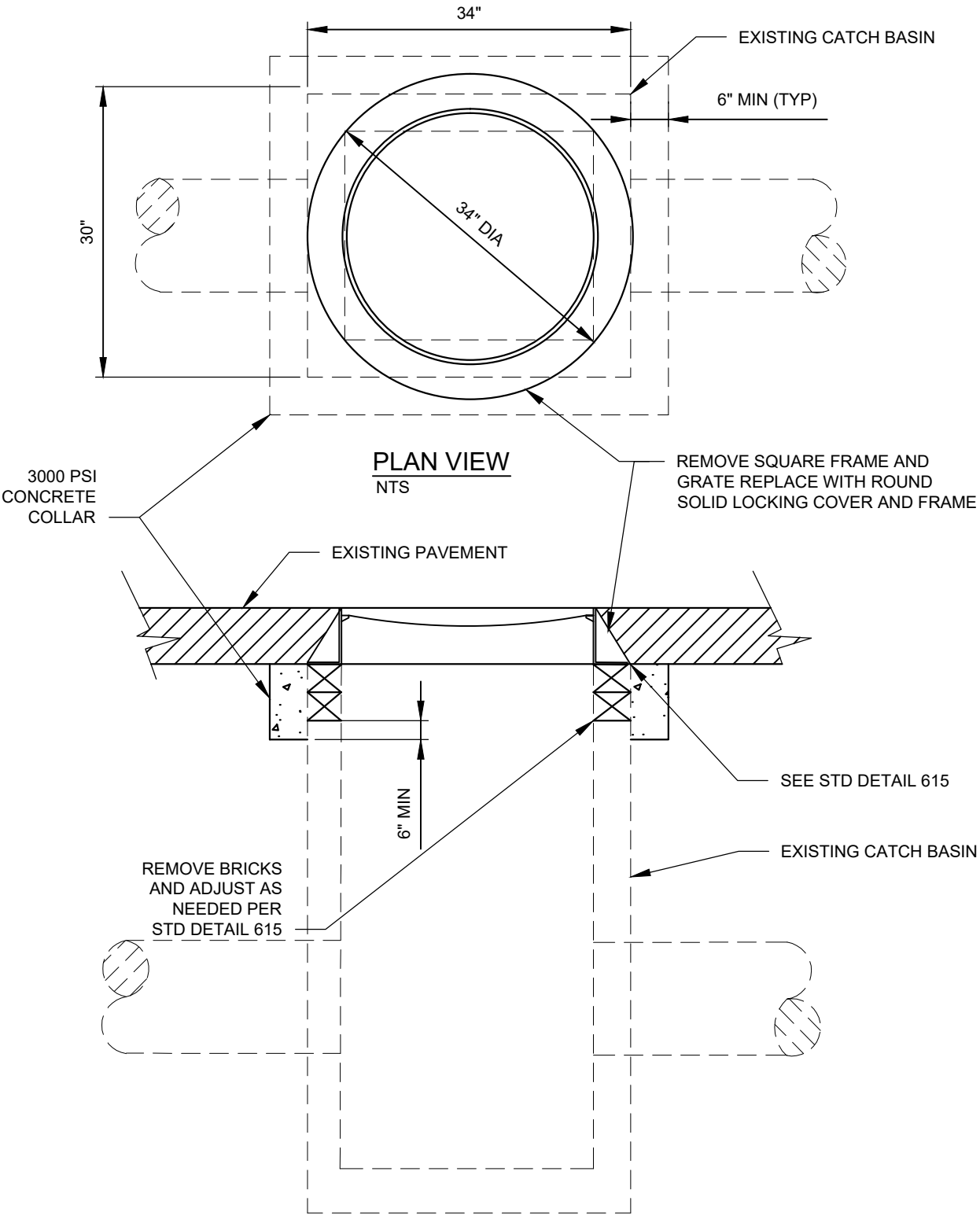
CityofRedmond
WASHINGTON

STANDARD DETAILS

SIDEWALK
UNDERDRAIN SYSTEM

FILE NAME: SD630.DWG

DETAIL NUMBER: 630



Gary M. Schimek

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NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

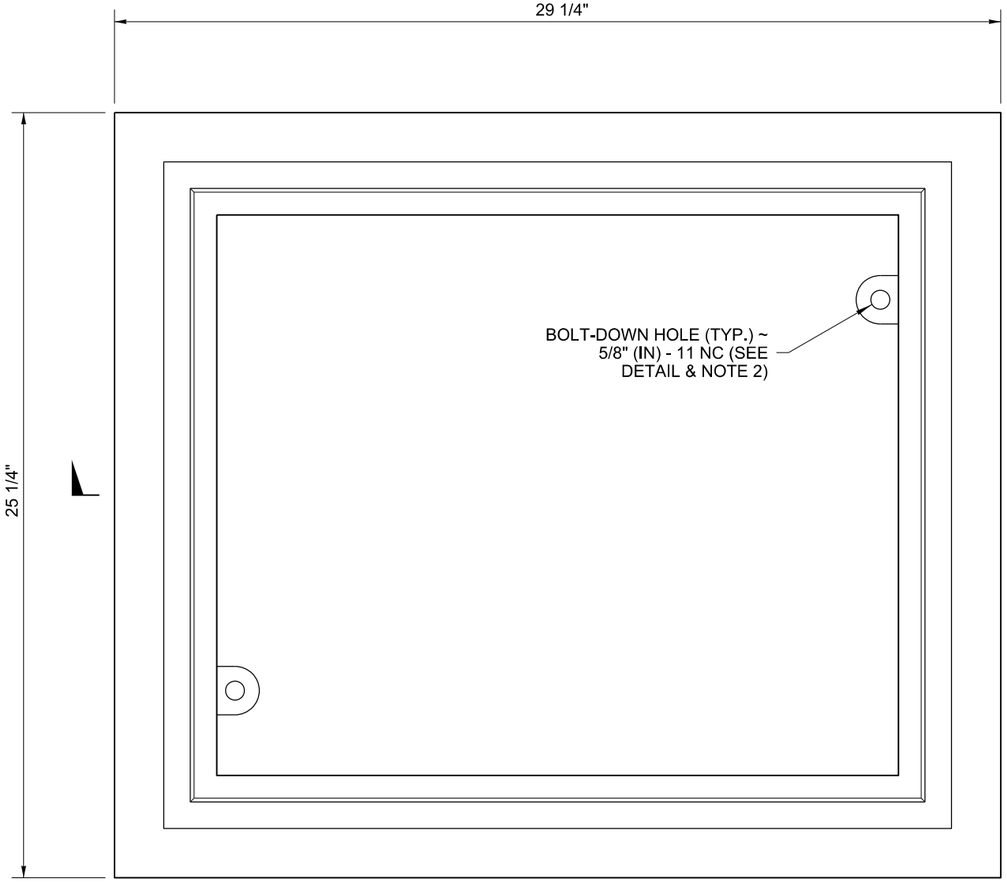
CityofRedmond
WASHINGTON

STANDARD DETAILS

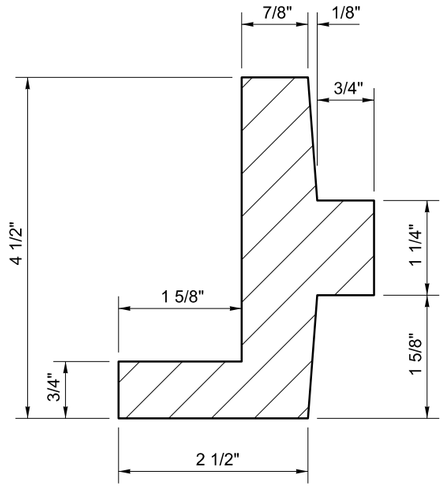
REPLACE FRAME & GRATE
WITH RING & COVER

FILE NAME: SD631.DWG

DETAIL NUMBER: 631



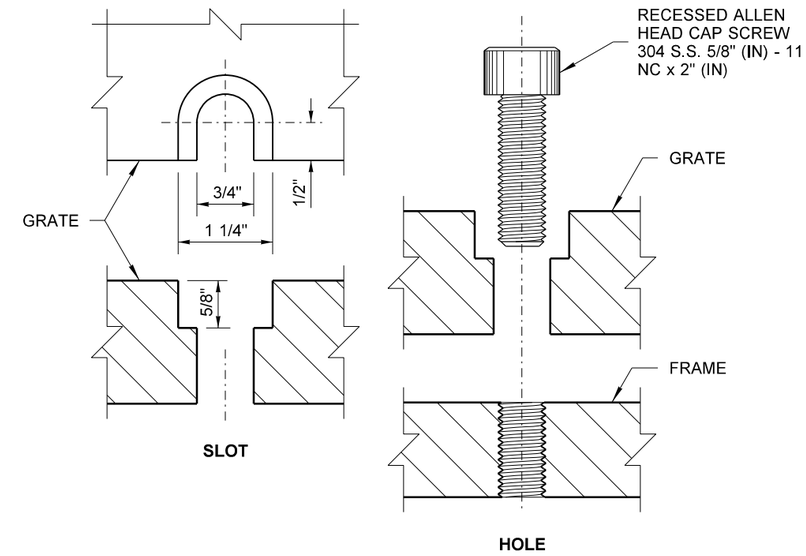
TOP



DETAIL B

NOTES

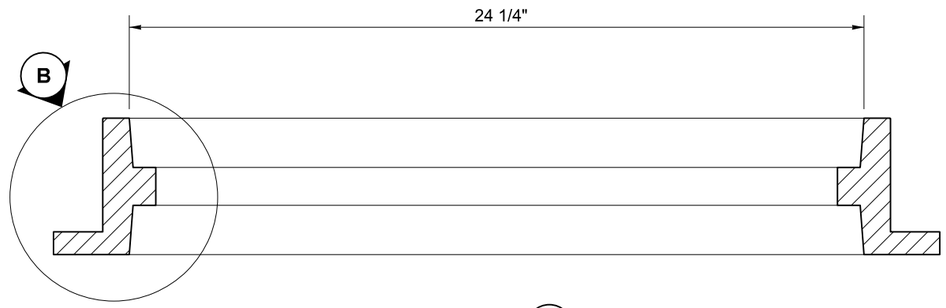
1. This frame is designed to accommodate 20" (in) × 24" (in) grates or covers as shown on **Standard Plans B-30.20, B-30.30, B-30.40,** and **B-30.50.**
2. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 304 Stainless Steel (S.S.) 5/8" (in) - 11 NC × 2" (in) allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.
3. Refer to **Standard Specification Section 9-05.15(2)** for additional requirements.



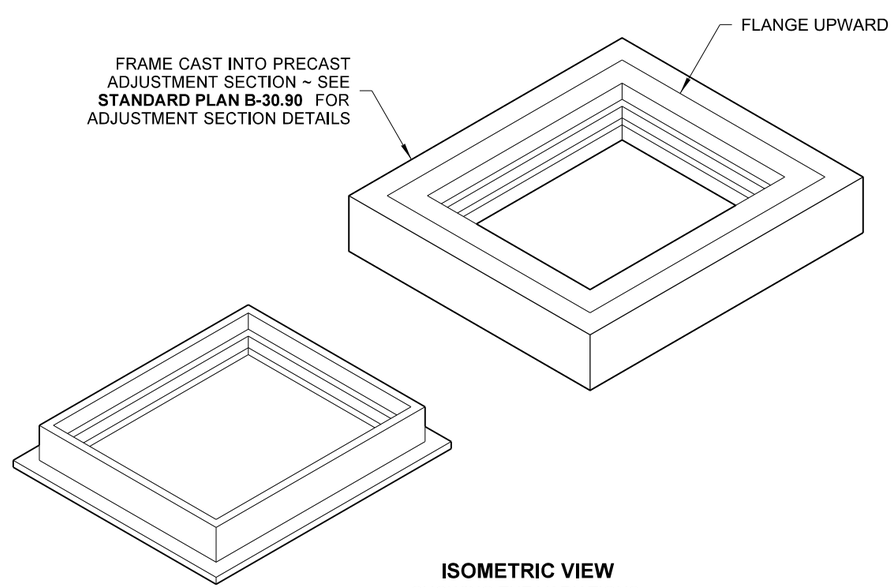
SLOT

HOLE

BOLT-DOWN DETAILS
SEE NOTE 2



SECTION A



ISOMETRIC VIEW
SHOWING THE VARIATIONS

RECTANGULAR FRAME (REVERSIBLE)

STANDARD PLAN B-30.10-02

SHEET 1 OF 1 SHEET

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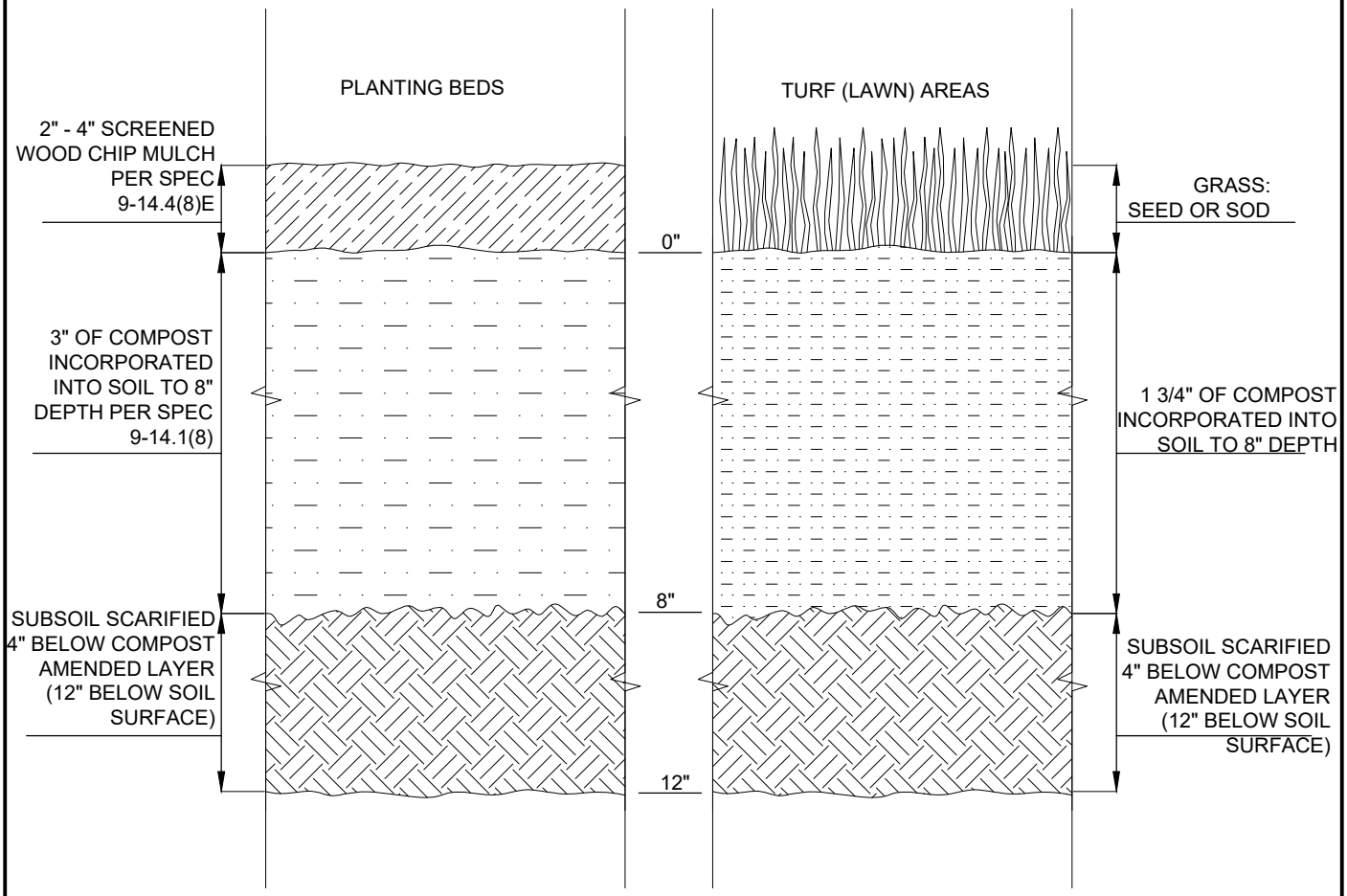
STATE DESIGN ENGINEER

Washington State Department of Transportation

DRAWN BY: FERN LIDDELL



SOIL AMENDMENT AND DEPTH

NTS

NOTES:

1. ALL SOIL AREAS DISTURBED OR COMPACTED DURING CONSTRUCTION, AND NOT COVERED BY BUILDINGS OR PAVEMENT, SHALL BE AMENDED WITH COMPOST TO A MINIMUM 8 INCH DEPTH, AND SUBSOIL SCARIFIED 4 INCH BELOW THAT COMPOST-AMENDED LAYER, FOR A FINISHED 12 INCH OF UN-COMPACTED DEPTH IN ALL LANDSCAPE AREAS. (SPEC 9-14.1(14))
2. PLANTING BED AND TURF AREA SOIL PREPARATION ARE THE SAME, EXCEPT FOR AMOUNT OF COMPOST AMENDMENT, AND MULCH ADDED TO PLANTING BEDS.
3. COMPOST SHALL BE TILLED INTO 8 INCH DEPTH INTO EXISTING SOIL, OR PLACE 8 INCHES OF COMPOST-AMENDED SOIL, PER SOIL SPECIFICATION. SUBSOIL SHALL BE SCARIFIED (LOOSENED) 4 INCHES BELOW AMENDED LAYER, TO PRODUCE 12-INCH DEPTH OF UN-COMPACTED SOIL, EXCEPT WHERE SCARIFICATION WOULD DAMAGE TREE ROOTS.
4. TURF AREAS SHALL RECEIVE 1.75 INCHES OF COMPOST TILLED INTO 8-INCH DEPTH, OR PLACE 8 INCHES OF IMPORTED SOIL CONTAINING 20-25% COMPOST BY VOLUME. THEN PLANT GRASS SEED OR SOD PER SPECIFICATIONS.
5. PLANTING BEDS SHALL RECEIVE 3 INCHES OF COMPOST TILLED INTO 8-INCH DEPTH, OR PLACE 8 INCHES OF IMPORTED SOIL CONTAINING 35-40% COMPOST BY VOLUME. MULCH AFTER PLANTING, WITH 2-4 INCHES OF ARBORIST WOOD CHIP MULCH OR APPROVED EQUAL.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

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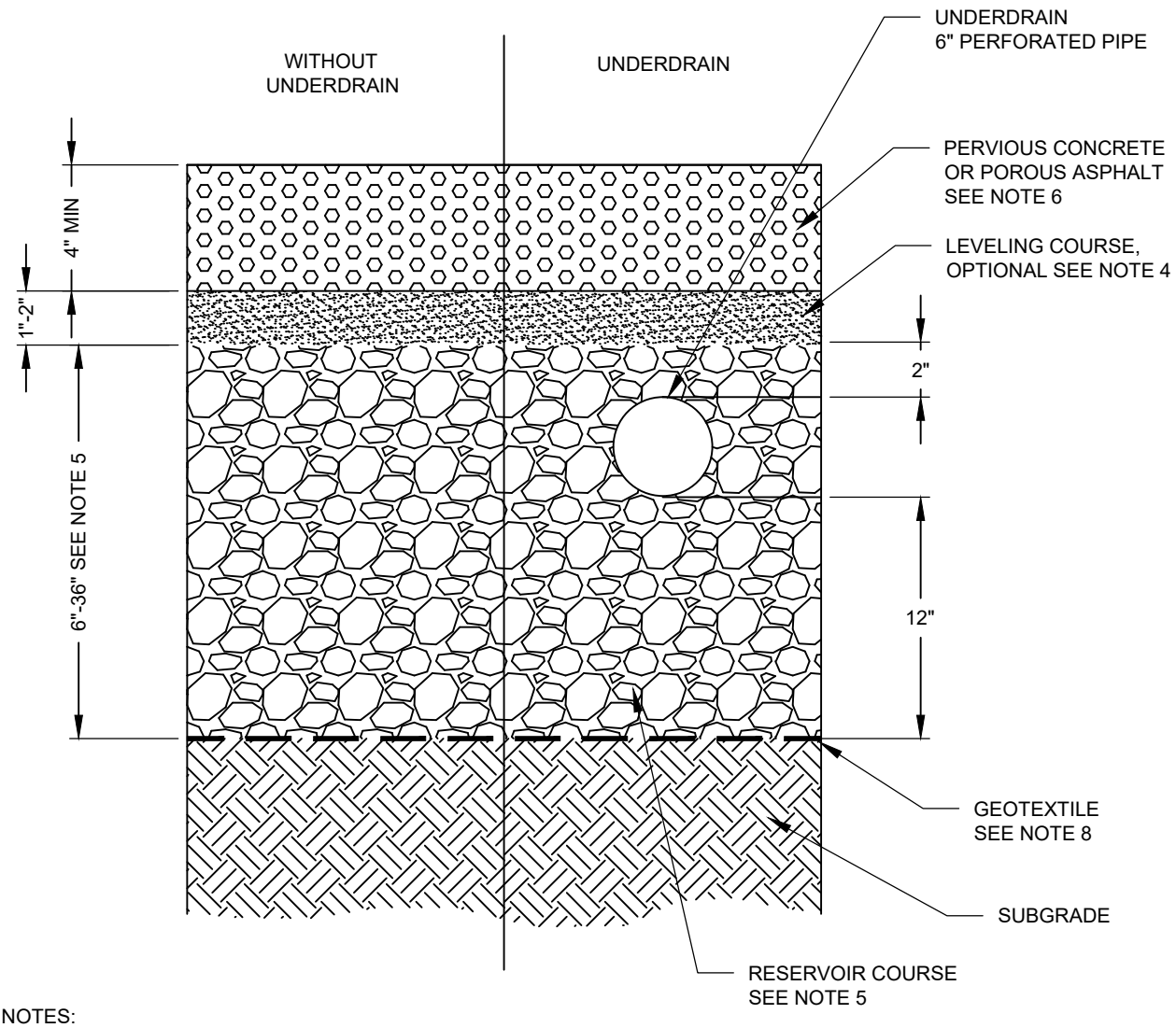
WASHINGTON

STANDARD DETAILS

SOIL AMENDMENT AND DEPTH

FILE NAME: SD632.DWG

DETAIL NUMBER: 632



NOTES:

1. THESE GUIDELINES PROVIDE A MINIMUM DEPTH FOR THE HYDROLOGIC PERFORMANCE. THE STRUCTURAL CAPACITY OF PAVEMENT SECTIONS WHEN SUBJECT TO VEHICULAR LOADS DEPENDS ON SEVERAL FACTORS AND MUST BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER.
2. LONGITUDINAL SLOPE, 0 TO 5% MAX FOR POROUS ASPHALT, 10% MAX FOR PERVIOUS CONCRETE.
3. USE CHECK DAM OR OTHER METHODS TO MAXIMIZE PONDING IN THE SUBSURFACE FOR LONGITUDINAL SLOPES EXCEEDING 2%. SEE STANDARD DETAIL 647.
4. LEVELING COURSE MATERIALS: GRAVEL BACKFILL FOR WALLS PER SPEC 9-03.12(2)
5. RESERVOIR COURSE MINIMUM DEPTH OF 6" WITHOUT UNDERDRAIN, 22" MINIMUM WITH UNDERDRAIN. PERMEABLE BALLAST PER SPEC 9-03.9(2)
6. PERVIOUS CONCRETE MUST BE INSTALLED BY A CERTIFIED PERVIOUS CONCRETE INSTALLER. POROUS ASPHALT MUST BE INSTALLED BY AN EXPERIENCED POROUS ASPHALT INSTALLER. (NRMCA OR EQUIVALENT).
7. PERMEABLE PAVEMENTS SHALL NOT BE USED FOR POLLUTION GENERATING SURFACES (SURFACES SUBJECT TO REGULAR VEHICLE TRAFFIC) IN WELLHEAD PROTECTION ZONES 1 AND 2.
8. GEOTEXTILE PER SPEC 9-33.2(1) TABLE 3, SOIL STABILIZATION, NONWOVEN. INSPECTOR MAY WAIVE GEOTEXTILE DEPENDING ON SUBGRADE.
9. PERMEABLE PAVEMENT SHALL NOT BE USED IN DOWNTOWN OR PUBLIC ROADS.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

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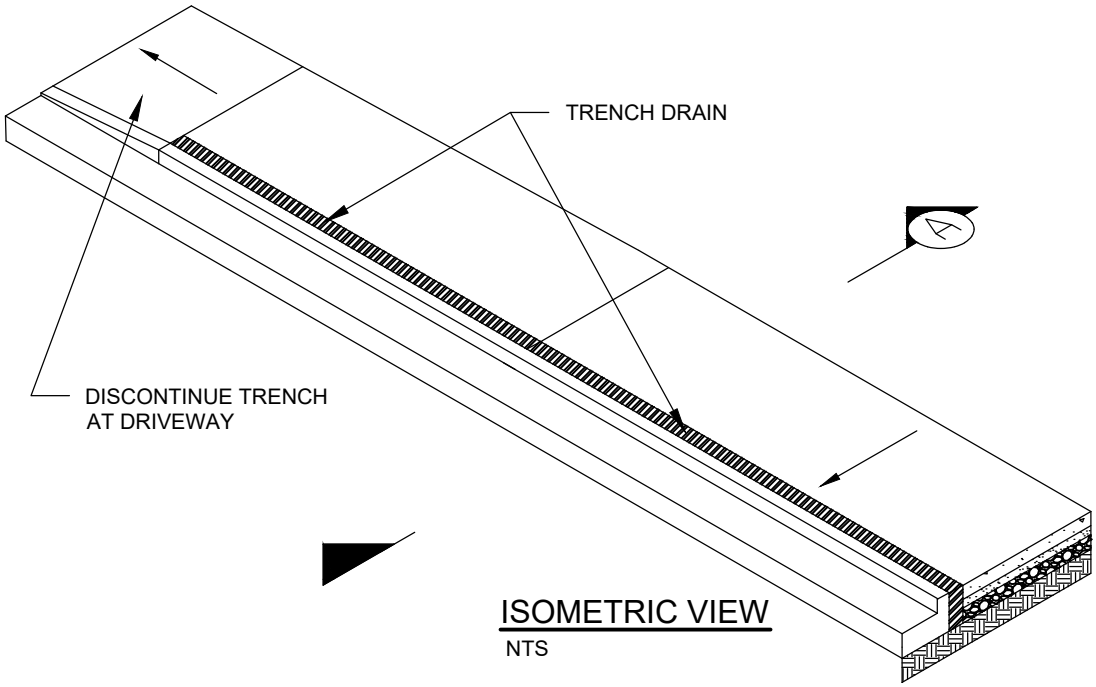
STANDARD DETAILS

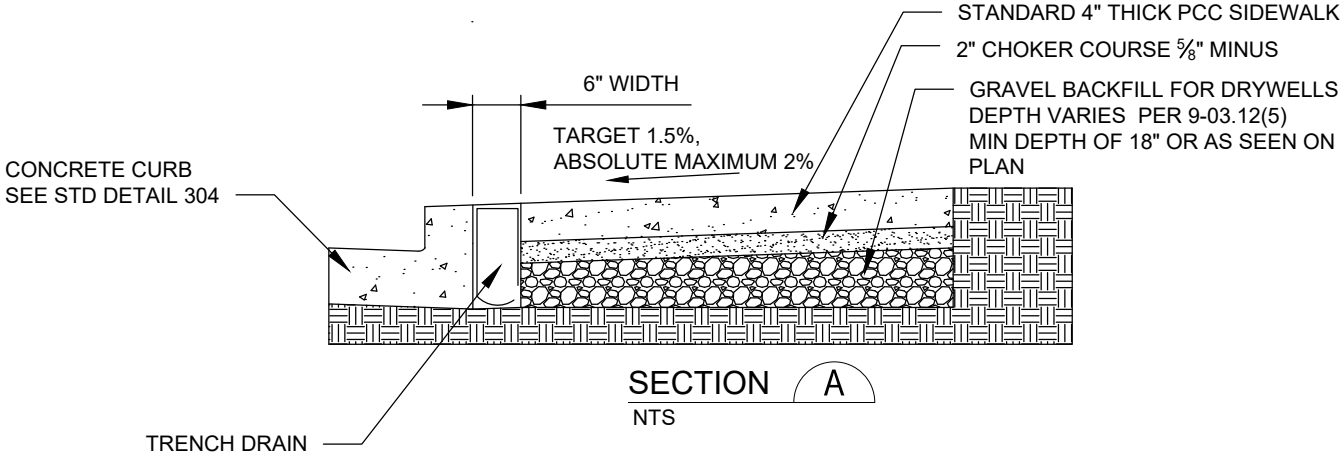
PERMEABLE PAVEMENT SECTION (PRIVATE USE ONLY)

FILE NAME: SD643.DWG

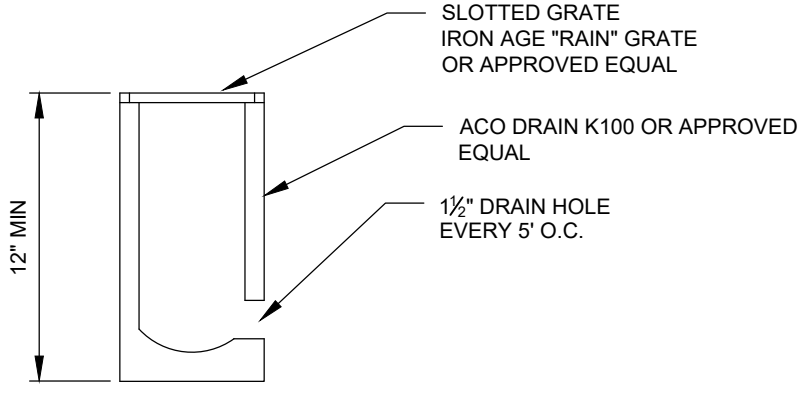
DETAIL NUMBER: 643



ISOMETRIC VIEW
NTS



SECTION A
NTS



TRENCH DRAIN
NTS

NOTES:

1. USE CHECK DAM OR OTHER METHODS TO MAXIMIZE PONDING IN THE SUBSURFACE FOR LONGITUDINAL SLOPES EXCEEDING 2%. SEE STANDARD DETAIL 647.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

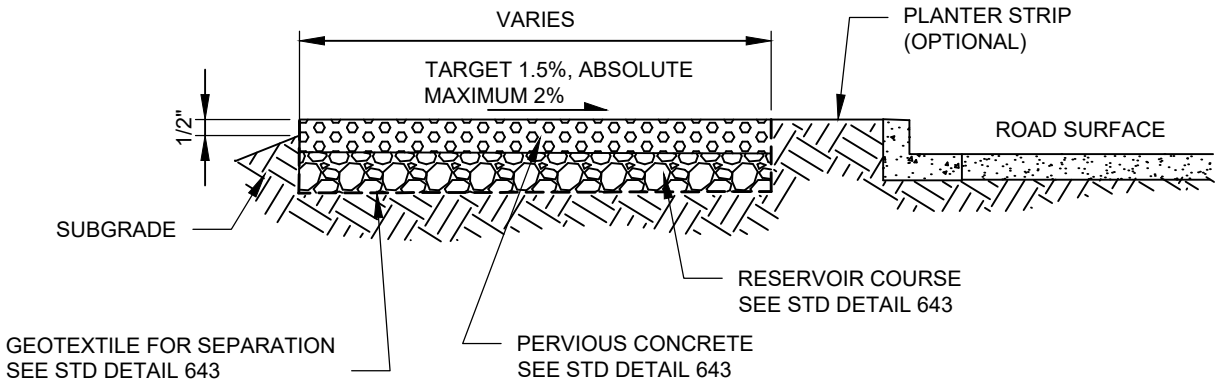
CityofRedmond
WASHINGTON

STANDARD DETAILS

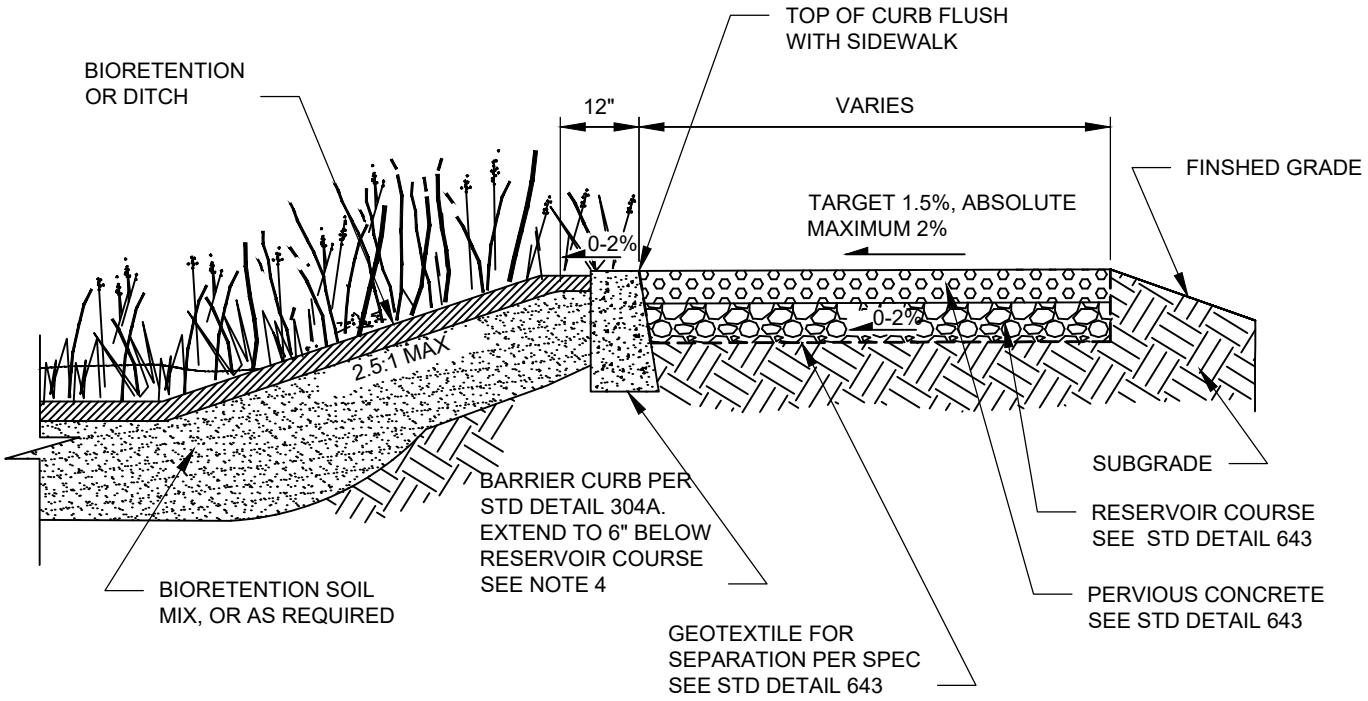
FUNCTIONAL EQUIVALENT INFILTRATION SIDEWALK

FILE NAME: SD645.DWG

DETAIL NUMBER: 645



PERVIOUS CONCRETE SIDEWALK ADJACENT TO CURB



ADJACENT TO BIORETENTION OR DITCH PERVIOUS CONCRETE SIDEWALK

NTS

NOTES:

1. ROUGH GRADE DITCH OR BIORETENTION FIRST.
2. SUBGRADE SHOULD NOT BE COMPACTED.
3. COVER TO PROTECT SURFACE UNTIL FINAL LANDSCAPING IS COMPLETE.
4. INSPECTOR MAY WAIVE BARRIER CURB DEPENDING ON SITE CONDITIONS
5. USE CHECK DAM OR OTHER METHODS TO MAXIMIZE PONDING IN THE SUBSURFACE FOR LONGITUDINAL SLOPES EXCEEDING 2%. SEE STANDARD DETAIL 647.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

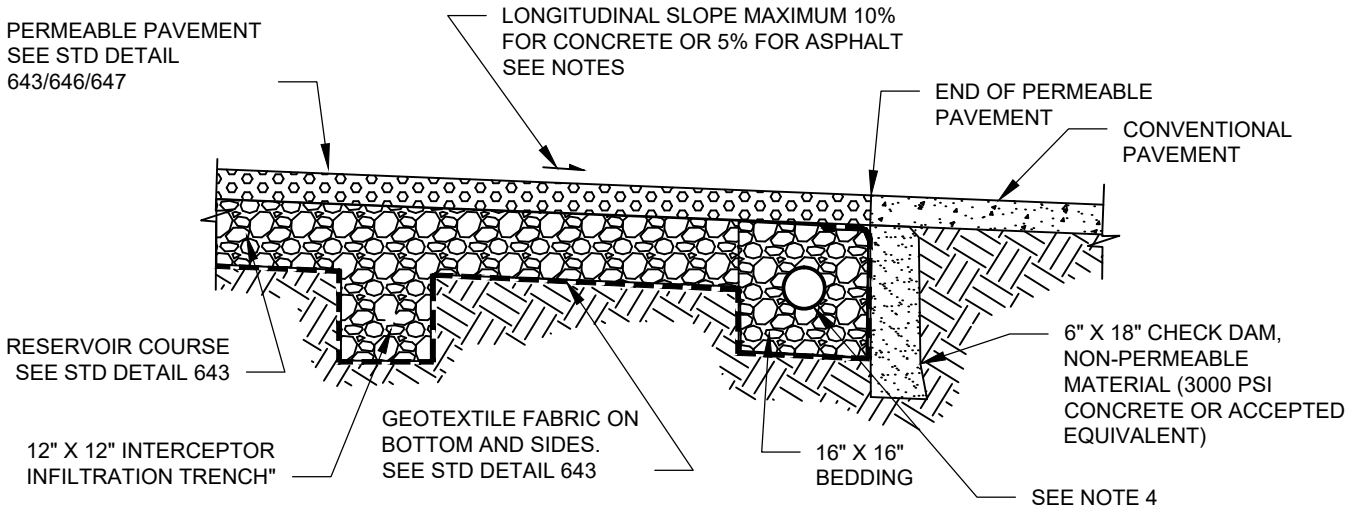
CityofRedmond
WASHINGTON

STANDARD DETAILS

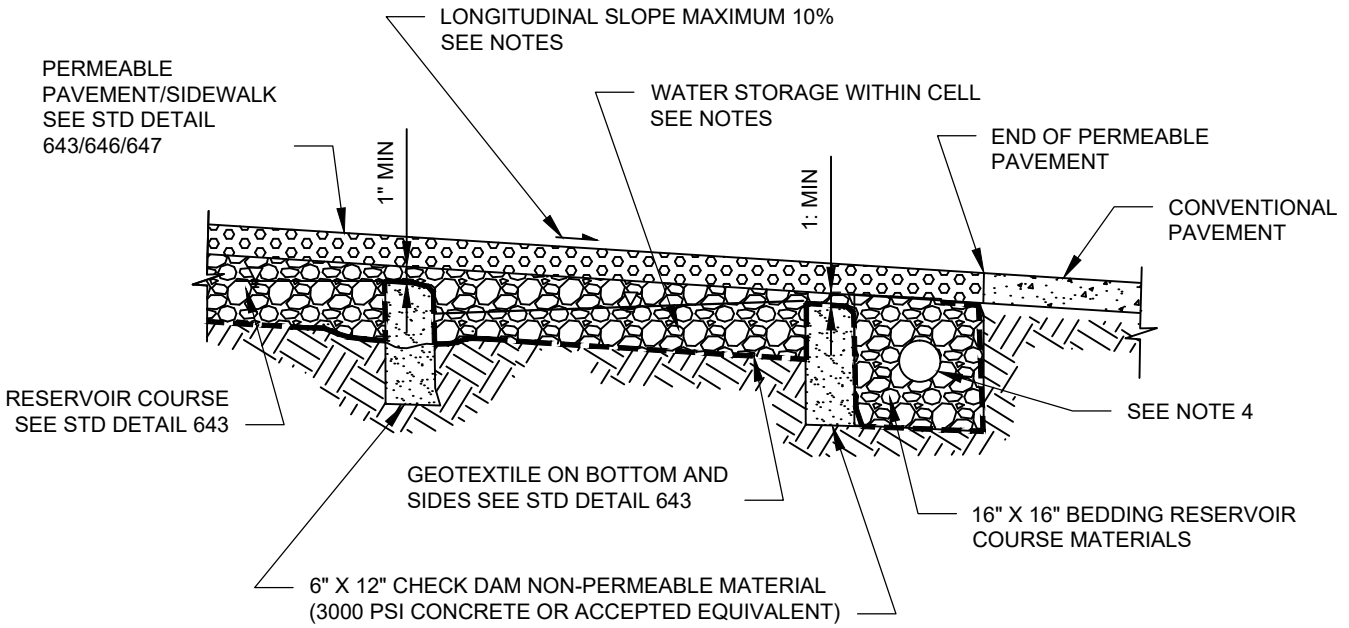
PERVIOUS CONCRETE SIDEWALK
PRIVATE USE ONLY

FILE NAME: SD646.DWG

DETAIL NUMBER: 646



INTERCEPTOR INFILTRATION TRENCH



CHECK DAM

NOTES:

1. FOR PRIVATE USE ONLY.
2. CHECK DAM OR INTERCEPTOR REQUIRED FOR LONGITUDINAL SLOPES > 2%.
3. SPACE CHECK DAMS BASED ON SLOPE TO ACHIEVE DESIGN AVERAGE PONDING DEPTH BEFORE OVERTOPPING DAM.
4. CALCULATE STORAGE VOLUME BETWEEN CHECK DAMS BASED ON CHECK DAM HEIGHT AND SLOPE FOR MODELING.
5. 6" PVC PERF PIPE WITH CLEANOUTS AND CONNECTION TO STORM, SIMILAR TO STD DETAIL 630.
6. PERMEABLE PAVEMENT NOT ALLOWED FOR POLLUTION GENERATING SURFACE IN WELLHEAD PROTECTION ZONE 1 AND 2.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

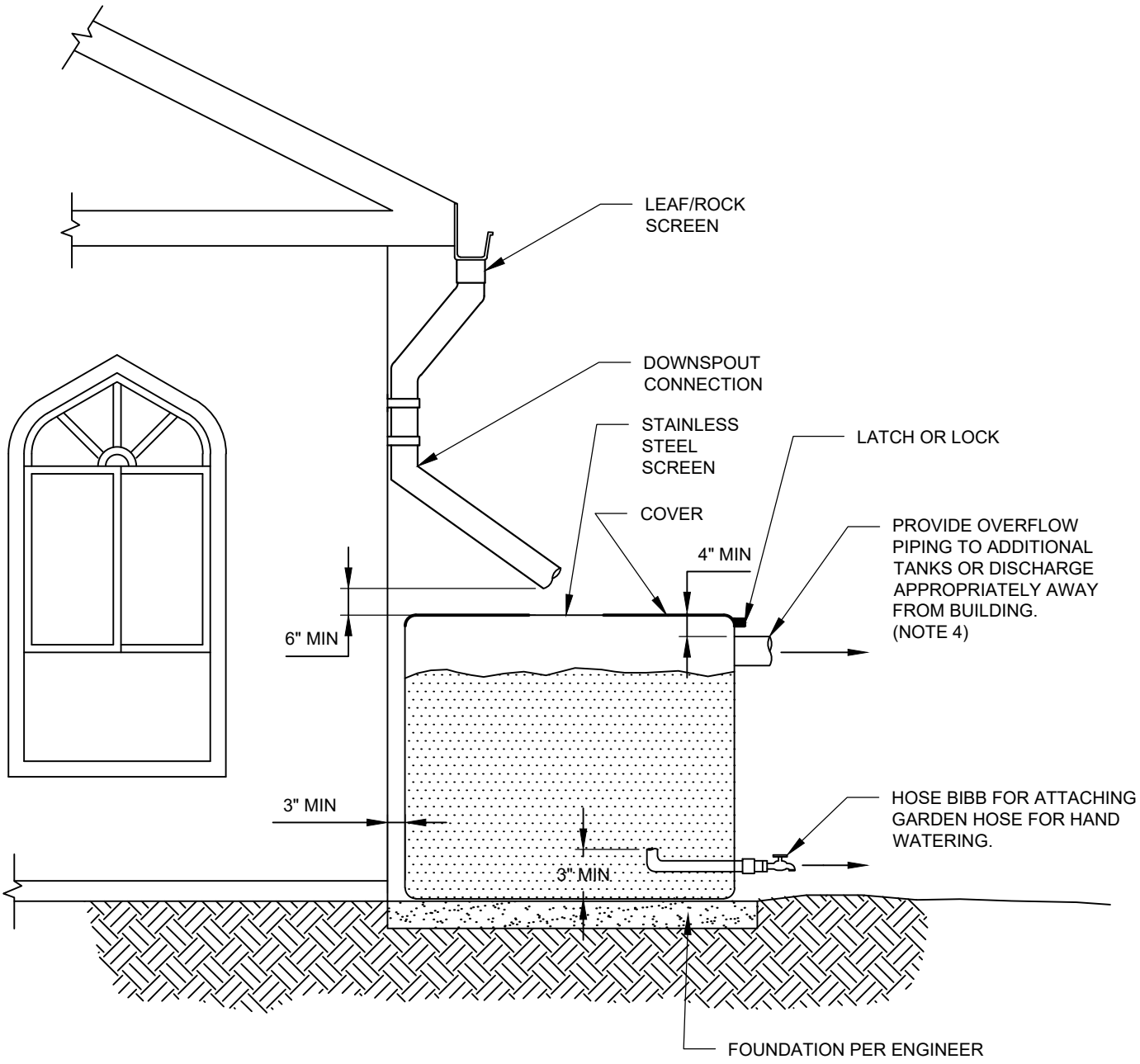
CityofRedmond
WASHINGTON

STANDARD DETAILS

PERMEABLE PAVEMENT
ON SLOPES (PRIVATE USE ONLY)

FILE NAME: SD647.DWG

DETAIL NUMBER: 647



NOTES:

1. ELECTRICAL PERMIT REQUIRED IF WATER PUMP IS TO BE INSTALLED.
2. ENGINEERING DESIGN IS REQUIRED FOR CISTERNS GREATER THAN 60 GALLONS OR FOR BELOW GROUND SYSTEMS.
3. THERE SHALL BE NO CONNECTION BETWEEN RAIN HARVESTING SYSTEM AND POTABLE WATER SUPPLY.
4. THE OWNER IS RESPONSIBLE FOR ENSURING SAFE DISCHARGE OF OVERFLOWS WITHOUT CONCENTRATING FLOWS TO CAUSE EROSION OR FLOODING.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2017

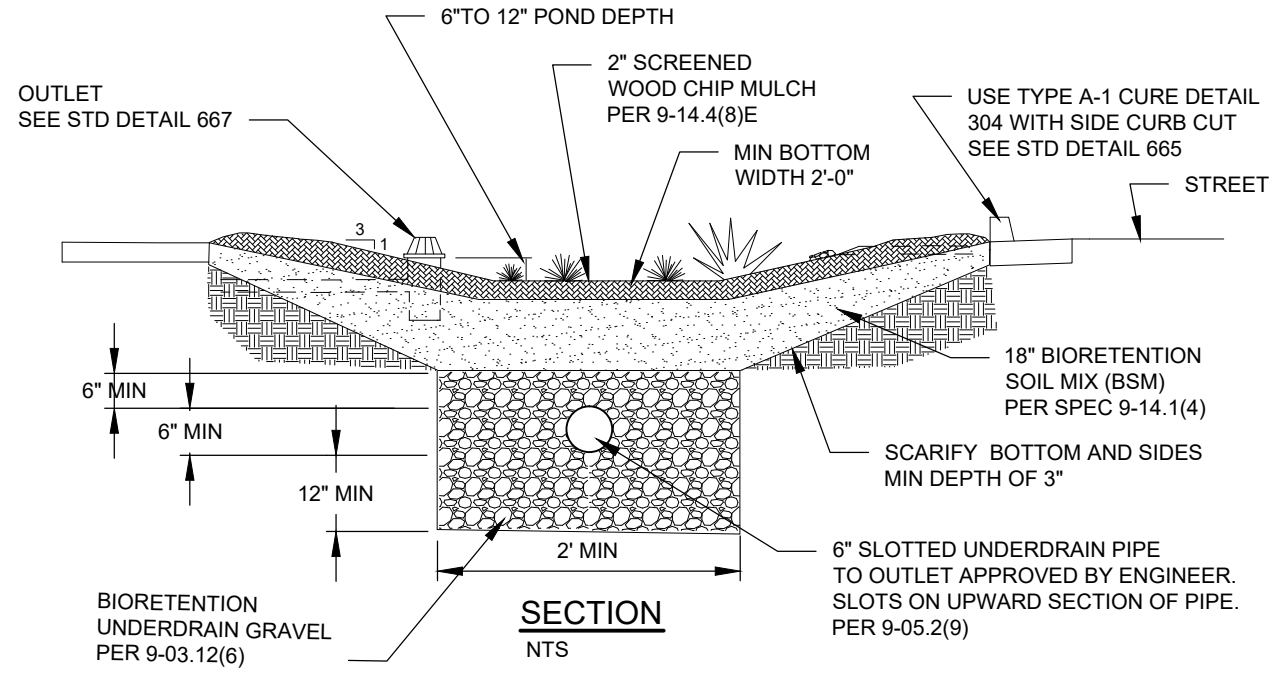
CityofRedmond
WASHINGTON

STANDARD DETAILS

ROOF RAIN HARVESTING

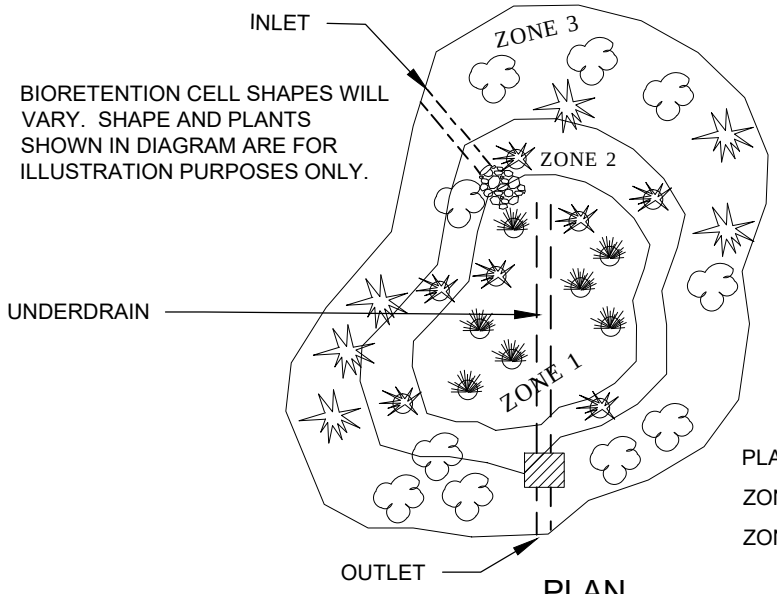
FILE NAME: SD650.DWG

DETAIL NUMBER: 650



SECTION

NTS



BIORETENTION CELL SHAPES WILL VARY. SHAPE AND PLANTS SHOWN IN DIAGRAM ARE FOR ILLUSTRATION PURPOSES ONLY.

PLAN

NTS

PLANTING ZONES:

ZONE 1: AREA WITH FREQUENT STANDING WATER

ZONE 2: AREA WITH OCCASIONAL STANDIN WATER, AND EXTENDED DRIER PERIOD.

ZONE 3: AREA WITH DRIER CONDITIONS.

NOTES:

1. MAXIMUM BOTTOM SLOPE OF CELL IS 0.5%
2. OVERFLOW POINT SHALL BE AT LEAST 6 INCHES BELOW ANY ADJACENT PAVEMENT AREA.
3 INSTALL STREAMBED COBBLE (1" - 4") AT INLET TO DISSIPATE RUNOFF
4. IF OPTIONAL UNDERDRAIN IS USED:
   - 0.5% MIN SLOPE
   - PROVIDE A CLEAN OUT EVERY 250-300 FEET
5. MINIMUM 3 FOOT DEPTH BETWEEN UNDERDRAIN (IF PRESENT) OR BOTTOM OF BIORETENTION SOIL MIX (BSM) AND WATER TABLE.
6. MINIMUM SETBACK OF 5 FEET FROM TOP OF BIORETENTION CELL TO BUILDING STRUCTURES AND PROPERTY LINES. DO NOT LOCATE IMMEDIATELY UP SLOPE OF BUILDING STRUCTURES.
7. AVOID COMPACTION OF EXISTING SUBGRADE BELOW PLANTER DURING CONSTRUCTION.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
NATURAL RESOURCES/STORMWATER ENGINEERING MANAGER

REVISION DATE: MARCH 01, 2018

CityofRedmond
WASHINGTON

STANDARD DETAILS

BIORETENTION FACILITY

FILE NAME: SD655.DWG

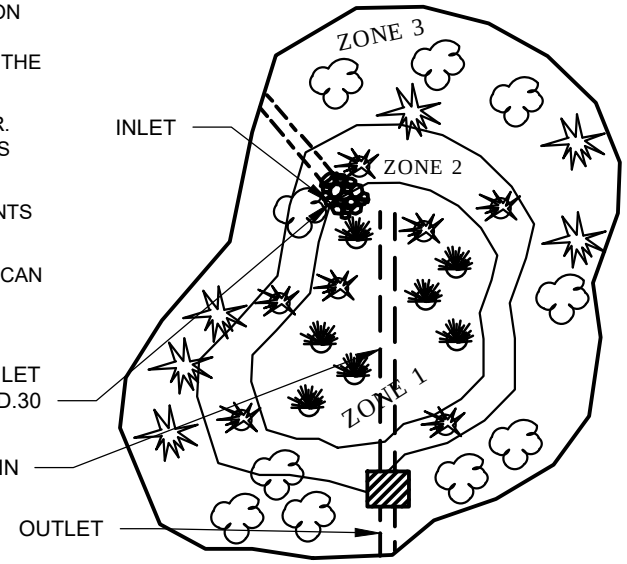
DETAIL NUMBER: 655

THE FOLLOWING LIST INCLUDES NATIVE AND NON-NATIVE PLANT SPECIES COMMONLY AVAILABLE IN PUGET SOUND, AND SUITABLE FOR BIORETENTION CELLS AND SWALES. SITE CHARACTERISTICS AND PROJECT GOALS MAY REQUIRE MODIFICATIONS TO PLANT PROPOSED HERE (PER APPROVAL BY THE ENGINEER).

ZONE 1: AREA OF PERIODIC OR FREQUENT STANDING OR FLOWING WATER. ZONE 1 PLANTS SHOULD ALSO TOLERATE SEASONAL DRY PERIODS UNLESS IRRIGATION IS AVAILABLE.

ZONE 2: AREA PERIODICALLY SATURATED DURING LARGER STORMS. PLANTS LISTED UNDER ZONE 2 MAY ALSO BE APPLICABLE IN ZONE 3.

ZONE 3: AREA WITH DRIER SOILS INFREQUENTLY SATURATED. THIS AREA CAN BE USED TO TRANSITION OR BLEND WITH THE EXISTING LANDSCAPE.



ZONE 1 EMERGENT PLANTS
CAREX APERTA / COLUMBIA SEDGE
CAREX OBNUPTA / SLOUGH SEDGE
CAREX ROSTRATA / BEAKED SEDGE
CAREX STIPATA / SAWBEAK SEDGE
DESCHAMPSIA CAESPITOSA / TUFTED HAIRGRASS
ELEOCHARIS PALUSTRIS / COMMON SPIKE RUSH
JUNCUS EFFUSUS / SOFT RUSH
JUNCUS ENSIFOLIUS / DAGGER-LEAF RUSH
JUNCUS TENUIS / SLENDER RUSH
SCIRPUS ACUTUS / HARDSTEM BULRUSH
SCIRPUS MICROCARPUS / SMALL-FRUITED BULRUSH
SPARGANIUM SP. / BURREED

ZONE 1 SHRUBS
CORNUS SERICEA / RED-OSIER DOGWOOD
CORNUS S. 'KELSEYI'/ DWARF RED-OSIER DOGWOOD
SALIX PURPUREA 'NANA'/DWARF ARCTIC WILLOW
SPIRAEA DOUGLASII / HARDHACK
SPIRAEA JAPONICA /

ZONE 2 HERBACEOUS PLANTS
AQUILEGIA SP. / COLUMBINE
ARUNCUS SYLVESTER / GOAT'S BEARD
ATHYRIUM FELIX-FEMINA / LADY FERN
IRIS DOUGLASIANA / PACIFIC IRIS
IRIS SIBIRICA / SIBERIAN IRIS

ZONE 2 SHRUBS
CORNUS SERICEA / RED-OSIER DOGWOOD
CORNUS S. 'KELSEYI'/ DWARF RED-OSIER DOGWOOD
LONICERA INVOLUCRATA / BLACK TWINBERRY
OEMLARIA CERASIFORMIS / INDIAN PLUM
SPIRAEA JAPONICA
SYMPHORICARPOS ALBA / SNOWBERRY

ZONE 3 HERBACEOUS PLANTS & GROUNDCOVER
ARCTOSTAPHYLOS SP.
FESTUCA OVINA 'GLAUCA' / BLUE FESCUE
GAULTHERIA SHALLON / SALAL
HEMEROCALIS VARS. / DAYLILY
HEUCHERA VARS. / ALUMROOT
LAVANDULA ANGUSTIFOLIA / LAVENDER
MAHONIA REPENS / CREEPING MAHONIA
POLYSTICHUM ACROSTICHOIDES / CHRISTMAS FERN
POLYSTICHUM MUNITUM / SWORD FERN
RUDBECKIA HIRTA / BLACK-EYED SUSAN

ZONE 3 SHRUBS
ABELIA X GRANDIFLORA
ESCALLONIA VARS.
HOLODISCUS DISCOLOR / OCEANSPRAY
MAHONIA AQUIIFOLIUM / OREGON GRAPE
POTENTILLA FRUTICOSA / CINQUEFOIL
RIBES SANGUINEUM / RED-FLOWERING CURRANT
ROSA GYMNOCARPA / BALDHIP ROSE
VACCINIUM OVATUM / EVERGREEN HUCKLEBERRY

NOTE: CERTAIN TREES MAY BE APROPRIATE FOR USE IN THESE FACILITIES AND SHOULD BE SELECTED PENDING SITE CONDITIONS.

SPECIAL CONSIDERATIONS: IN ADDITION TO SOIL MOISTURE ZONES, PLANTS SHOULD BE SELECTED TO FIT EXPOSURE,AESTHETICS AND SAFETY ISSUES .
EXPOSURE: CAREFUL CONSIDERATION SHOULD BE GIVEN TO SELECTING PLANTS FOR SUN / SHADE EXPOSURE AT THE SITE. MANY RAIN GARDENS ARE LARGELY SURROUNDED WITH PAVEMENT WHICH INCREASES THE HEAT EFFECTS OF SUN EXPOSURE.
DROUGHT TOLERANCE: THIS LIST EMPHASIZES NATIVE PLANTS, WHICH ARE GENERALLY WELL ADAPTED TO WET WINTER AND DRY SUMMER CONDITIONS. HOWEVER, SEVERAL ZONE 1 PLANTS WILL REQUIRE IRRIGATION. IN GENERAL, ALL PLANTINGS REQUIRE WATER DURING ESTABLISHMENT.
SIGHT CLEARANCE: ENSURE ADEQUATE SIGHT DISTANCE FOR ALL USERS PER CODE.
TREES: TREES MAY NOT BE APPROPRIATE IN ALL BIORETENTION CELLS, AND PLACEMENT MUST BE APPROVED BY THE ENGINEER. CONSIDER HEIGHT, SPREAD, AND EXTENT OF ROOTS AT MATURITY. USE CAUTION IN TREE SELECTION FOR AREAS WITH UNDER-DRAIN PIPES OR OTHER STRUCTURES. SEE APPENDIX 1: STREET TREES FOR MORE INFORMATION ON TREE SELECTION AND PLACEMENT SUGGESTIONS.

NOTES:

USE A MINIMUM OF 3 DIFFERENT SHRUBS AND 3 EMERGENT/GROUNDCOVER SPECIES IN EACH ZONE.

MINIMUM PLANT QUANTITIES ARE 90 PLANTS PER 100 SQ. FT. TREATMENT AREA, INCLUDING 4 SHRUBS MIN.

BIORETENTION CELLS MUST CONTAIN PLANTING ZONES 1, 2 AND 3, BIORETENTION CELLS WITH VERTICAL WALLS MAY NOT CONTAIN ALL THREE PLANTING ZONES.

EMERGENT PLANTS SHALL BE 4 INCH POTS OR 10 C.I.PLUGS, PLACED IN CLUSTERS OF 7-15 PLANTS AT 9 INCH O.C.

SHRUBS SHALL BE 1-GALLON, PLACED IN CLUSTERS OF 3-7.

NO TURF GRASS SHALL BE USED IN BIORETENTION CELLS.

Gary M. Schimek

APPROVED BY: GARY M. SCHIMEK
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REVISION DATE: MARCH 01, 2017

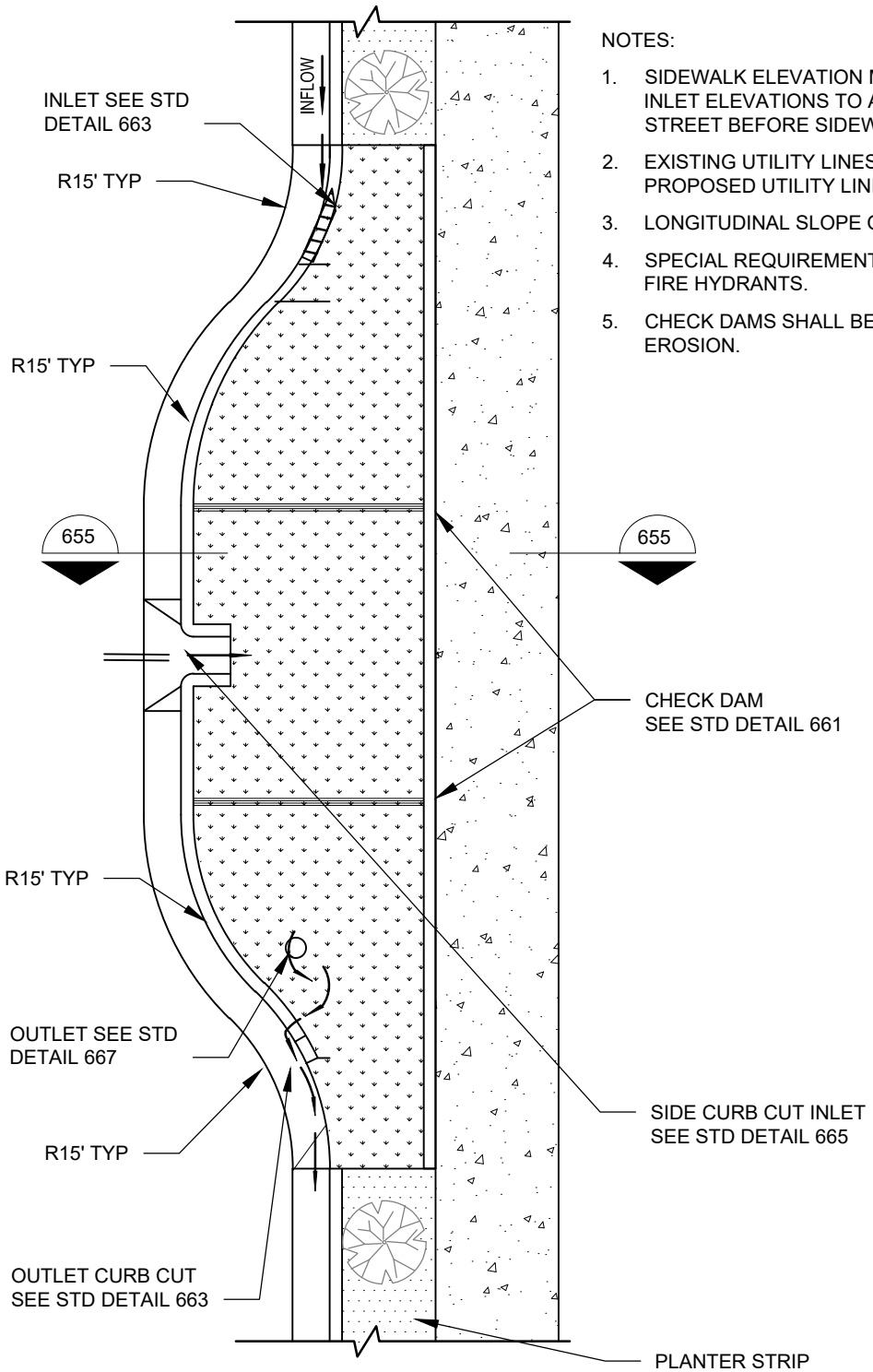
CityofRedmond
WASHINGTON

STANDARD DETAILS

BIORETENTION PLANT PALETTE

FILE NAME: SD657.DWG

DETAIL NUMBER: 657



NOTES:

1. SIDEWALK ELEVATION MUST BE SET ABOVE CHECK DAM AND INLET ELEVATIONS TO ALLOW OVERFLOW TO DRAIN TO STREET BEFORE SIDEWALK.
2. EXISTING UTILITY LINES MUST BE SLEEVED OR RELOCATED. PROPOSED UTILITY LINES TO BE LOCATED OUT OF FACILITY.
3. LONGITUDINAL SLOPE OF PLANTER MATCHES THE ROAD.
4. SPECIAL REQUIREMENTS FOR WATER LINES, METERS, AND FIRE HYDRANTS.
5. CHECK DAMS SHALL BE PLACED AS NEEDED TO PREVENT EROSION.

PLAN
NTS

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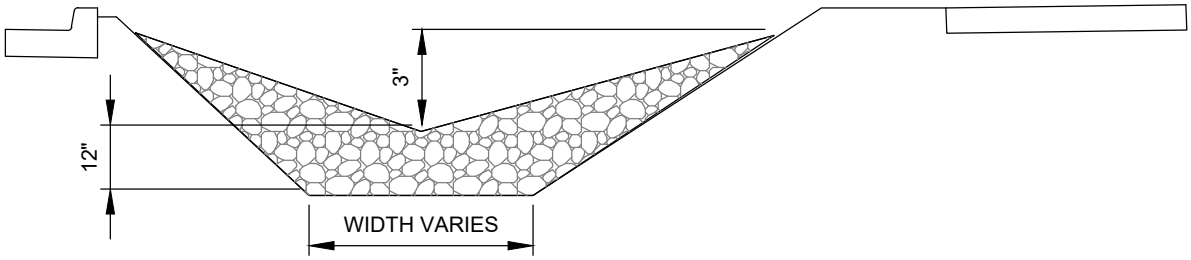
STANDARD DETAILS

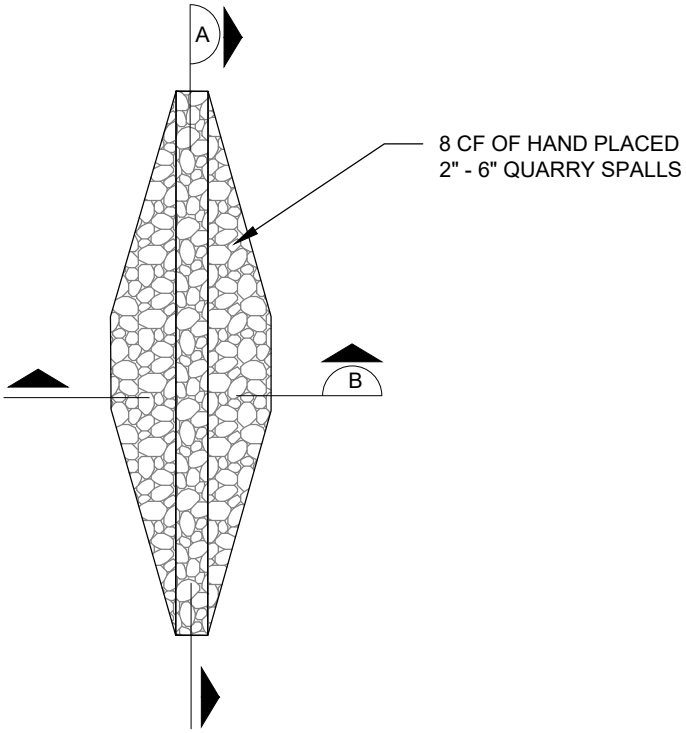
BIORETENTION
CURB EXTENSION

FILE NAME: SD659.DWG

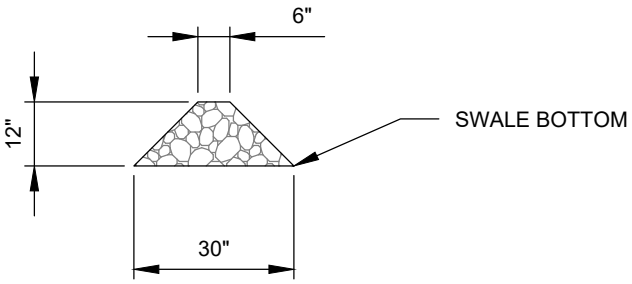
DETAIL NUMBER: 659



SECTION A
NTS



TOP VIEW
NTS



SECTION B
NTS

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REVISION DATE: MARCH 01, 2017

CityofRedmond
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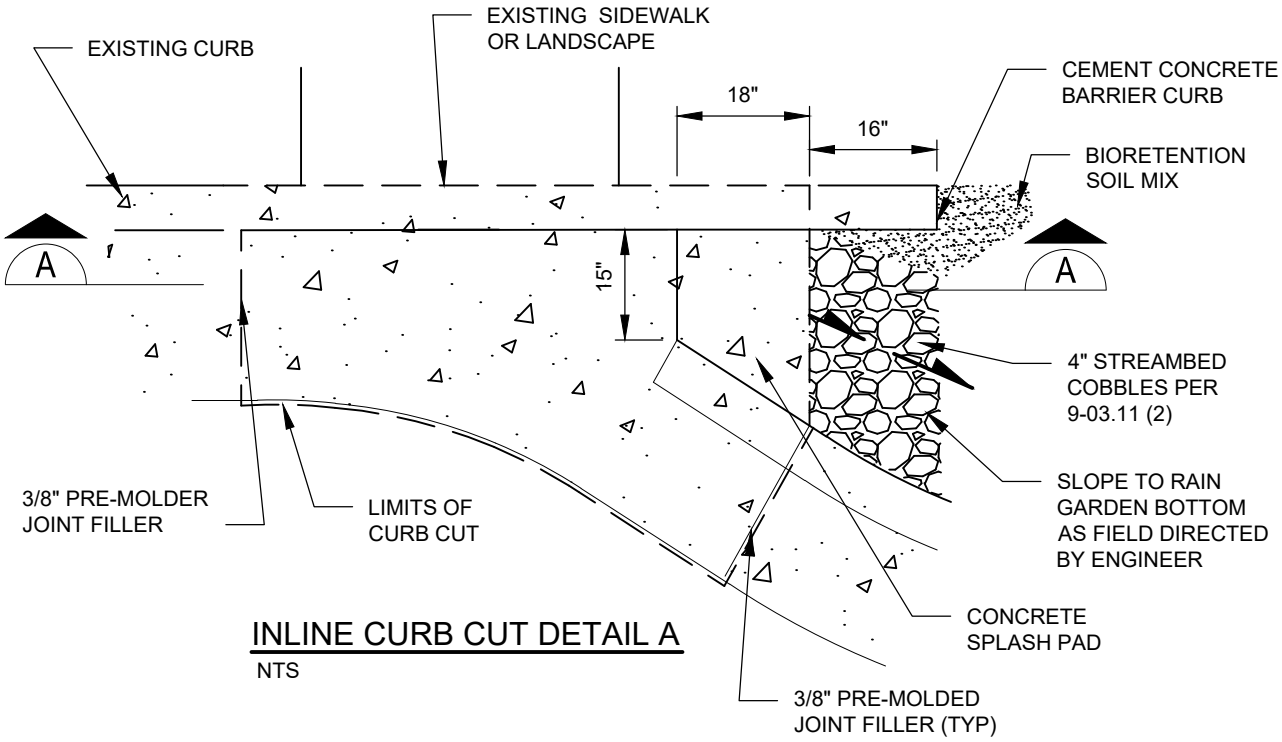
STANDARD DETAILS

BIORETENTION CHECK DAM

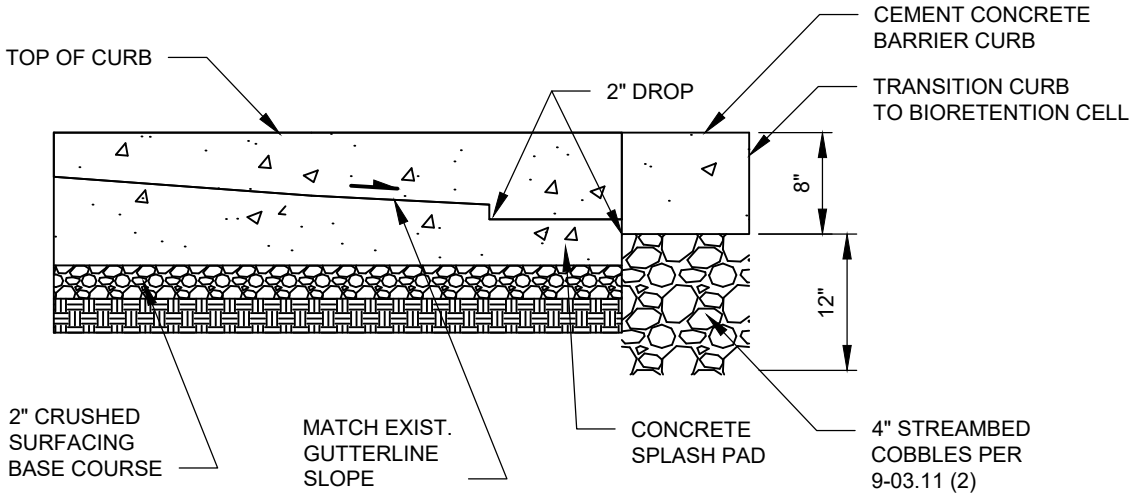
FILE NAME: SD661.DWG

DETAIL NUMBER: 661



INLINE CURB CUT DETAIL A

NTS



INLINE CURB CUT SECTION A-A

NTS

Gary M. Schimek

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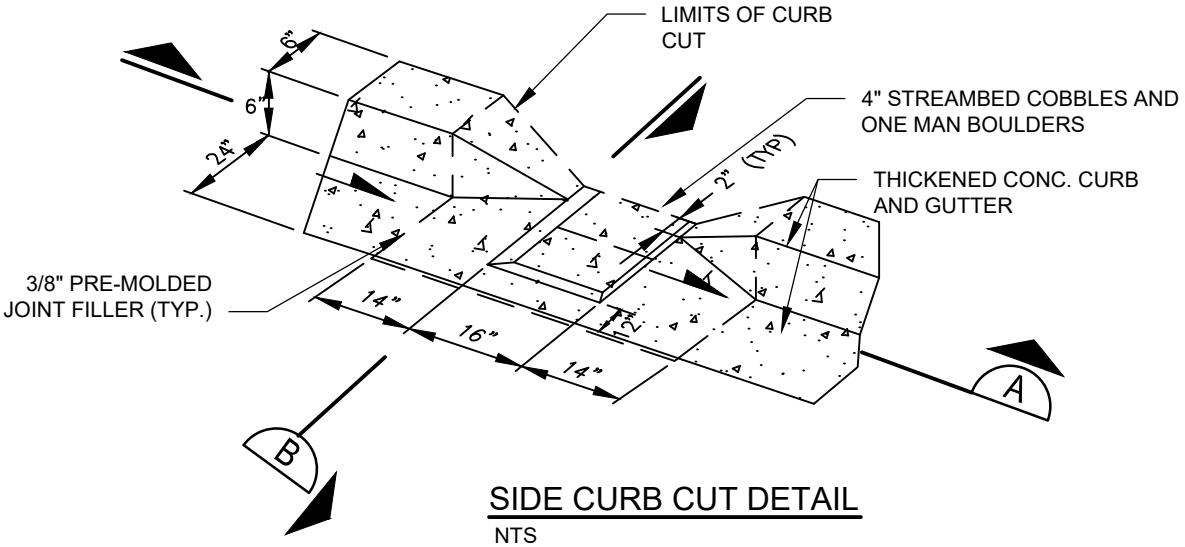
STANDARD DETAILS

BIORETENTION IN-LINE CURB CUT

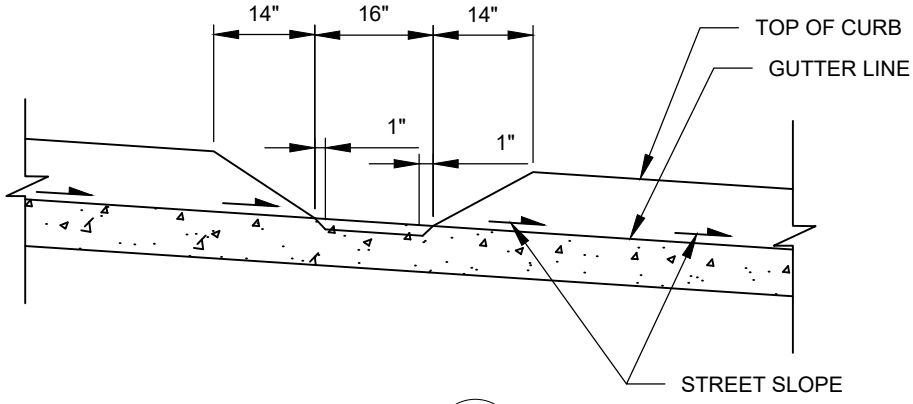
FILE NAME: SD663.DWG

DETAIL NUMBER: 663



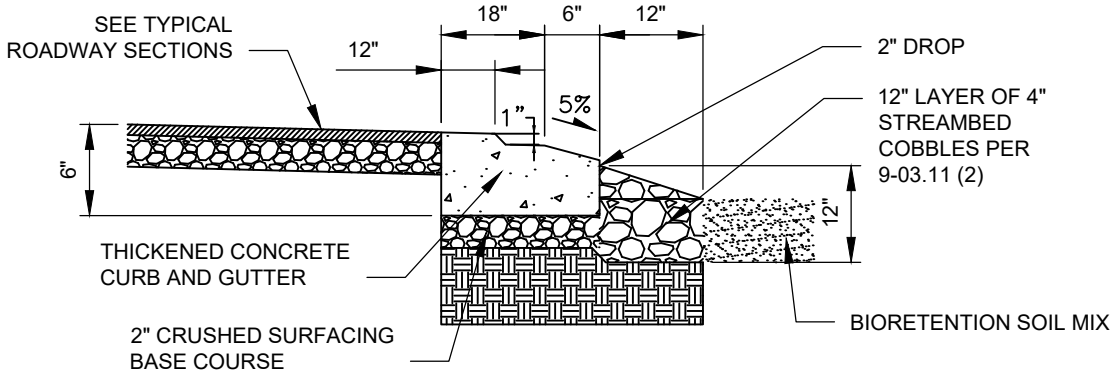
SIDE CURB CUT DETAIL

NTS



SECTION A

NTS



SECTION B

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REVISION DATE: MARCH 01, 2017

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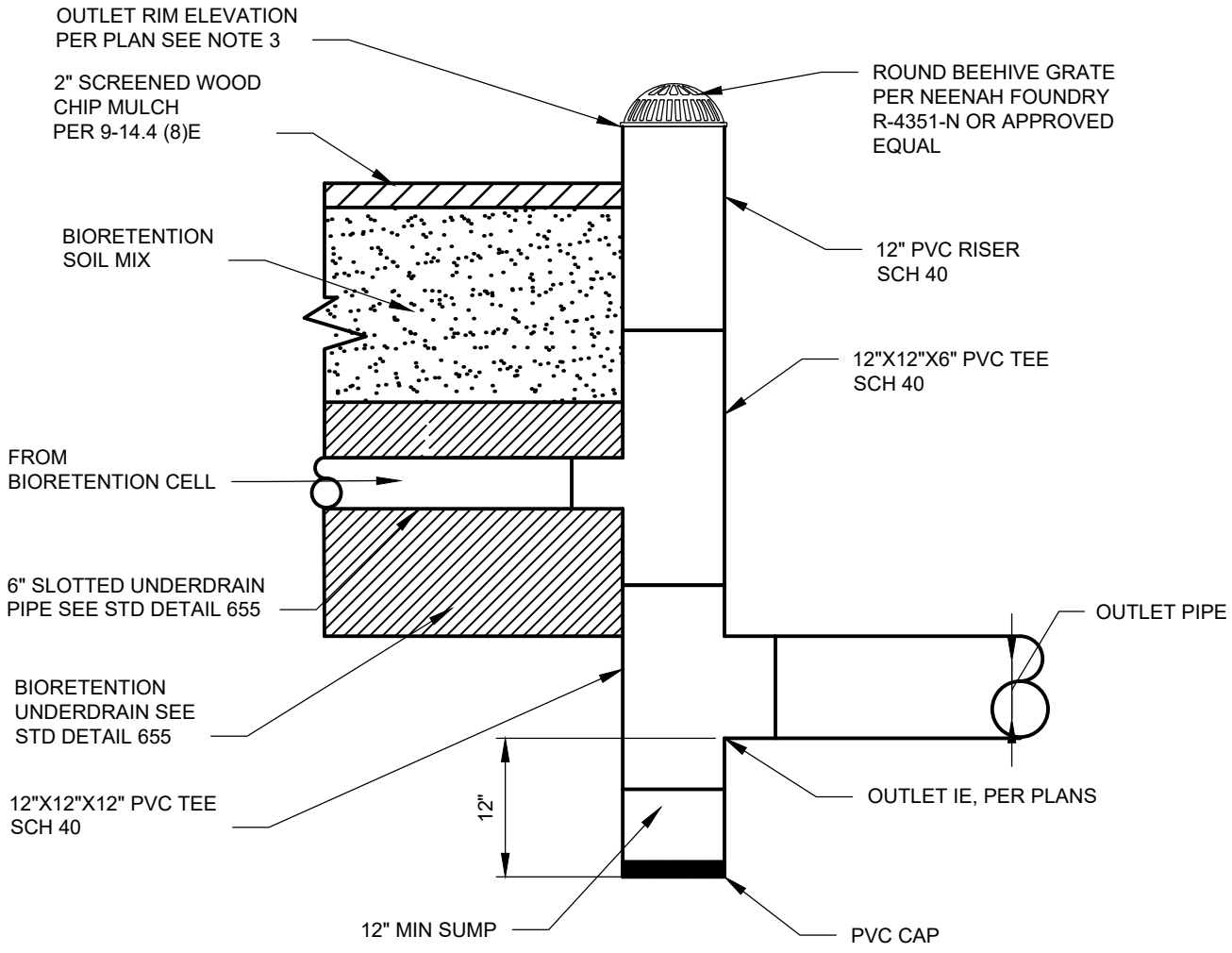
STANDARD DETAILS

BIORETENTION SIDE CURB CUT

FILE NAME: SD665.DWG

DETAIL NUMBER: 665



OUTLET STRUCTURE

NTS

NOTES:

1. ALL FITTINGS TO BE RUBBER GASKETED.
2. ALL PVC RISERS AND FITTINGS INSTALLED ABOVE GRADE SHALL HAVE PROTECTIVE ULTRAVIOLET COATING, OPAQUE LATEX WATER BASED PAINT OR APPROVED EQUAL.
3. OUTLET RIM 3 INCH MINIMUM BELOW ADJACENT PAVEMENT OF SIDEWALK.

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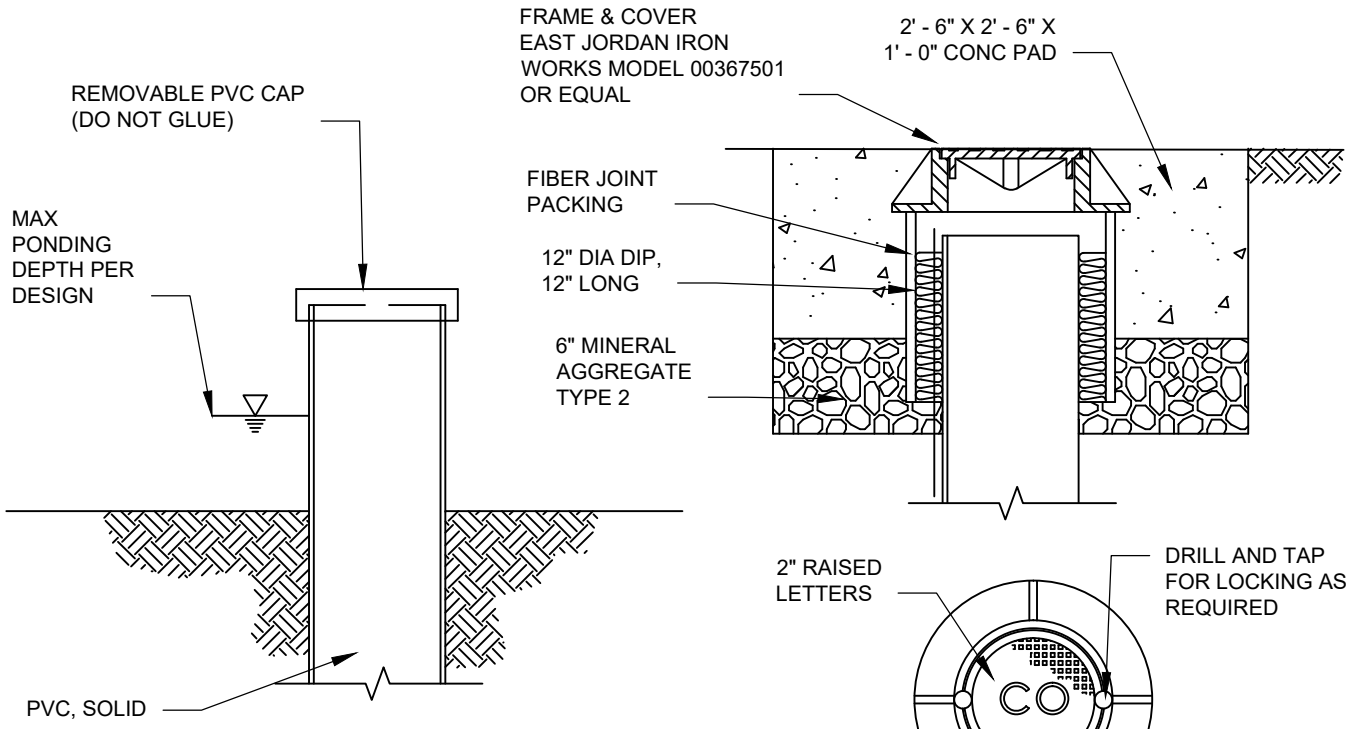
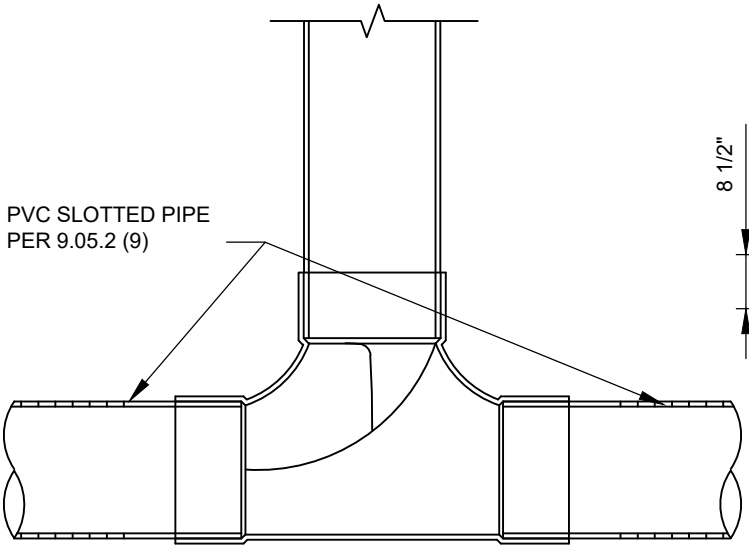
STANDARD DETAILS

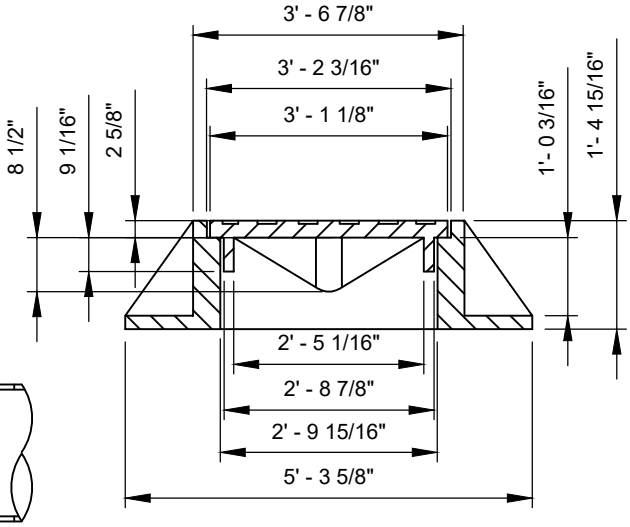
BIORETENTION OUTLET STRUCTURE

FILE NAME: SD667.DWG

DETAIL NUMBER: 667







BIORETENTION CLEAN OUT
NTS

CAST IRON FRAME AND COVER
NTS

NOTES:

1. LOCATE CLEANOUTS IN PAVED AREAS ADJACENT TO BIORETENTION WHERE POSSIBLE.

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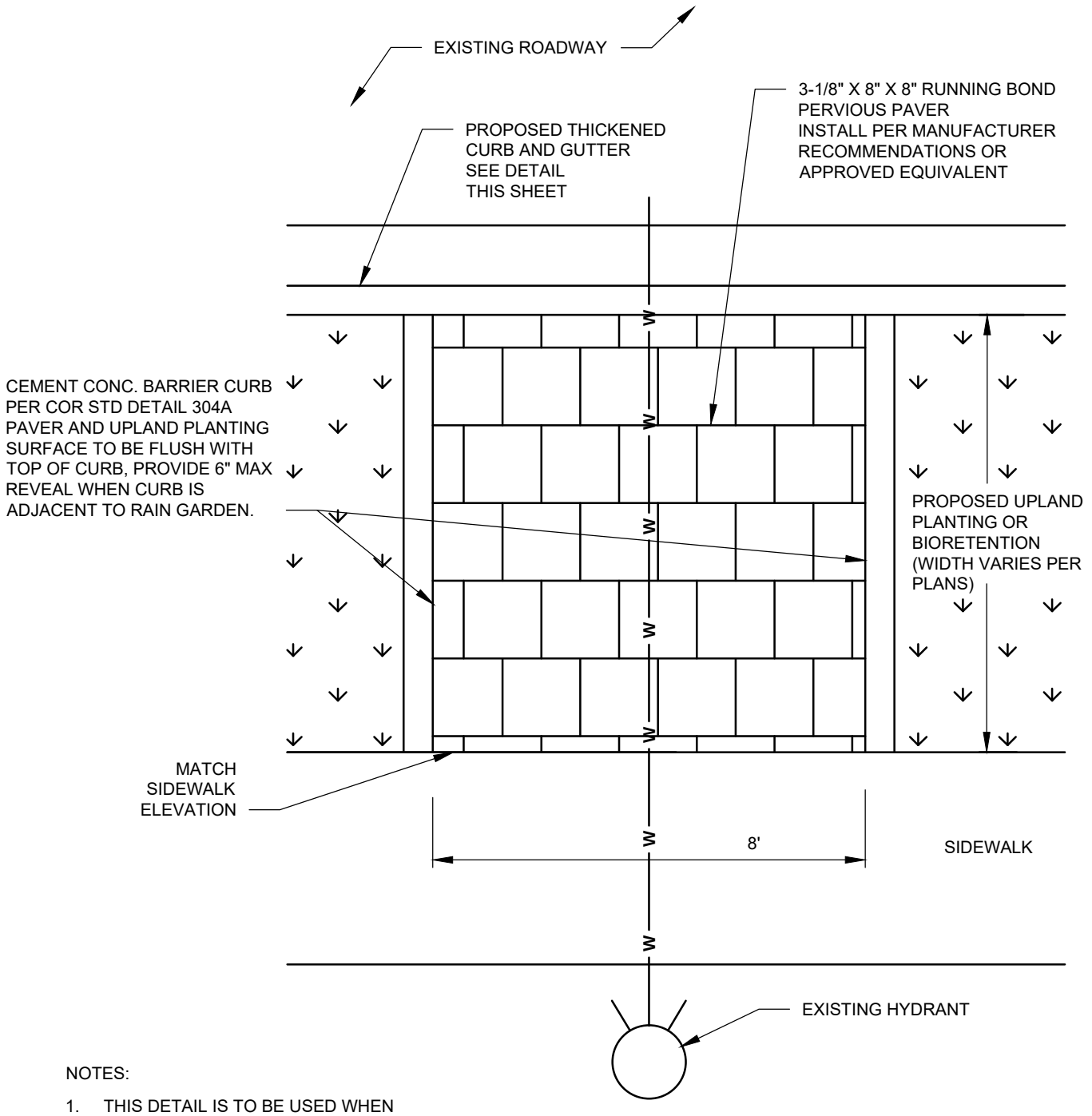
STANDARD DETAILS

BIORETENTION CLEANOUT

FILE NAME: SD669.DWG

DETAIL NUMBER: 669



NOTES:

1. THIS DETAIL IS TO BE USED WHEN BIORETENTION IS ON BOTH SIDES OF THE STREET, OTHERWISE LOCATE FIRE HYDRANT ON OPPOSITE SIDE OF THE STREET FROM THE BIORETENTION CELL.

PLAN

NTS

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REVISION DATE: MARCH 01, 2018

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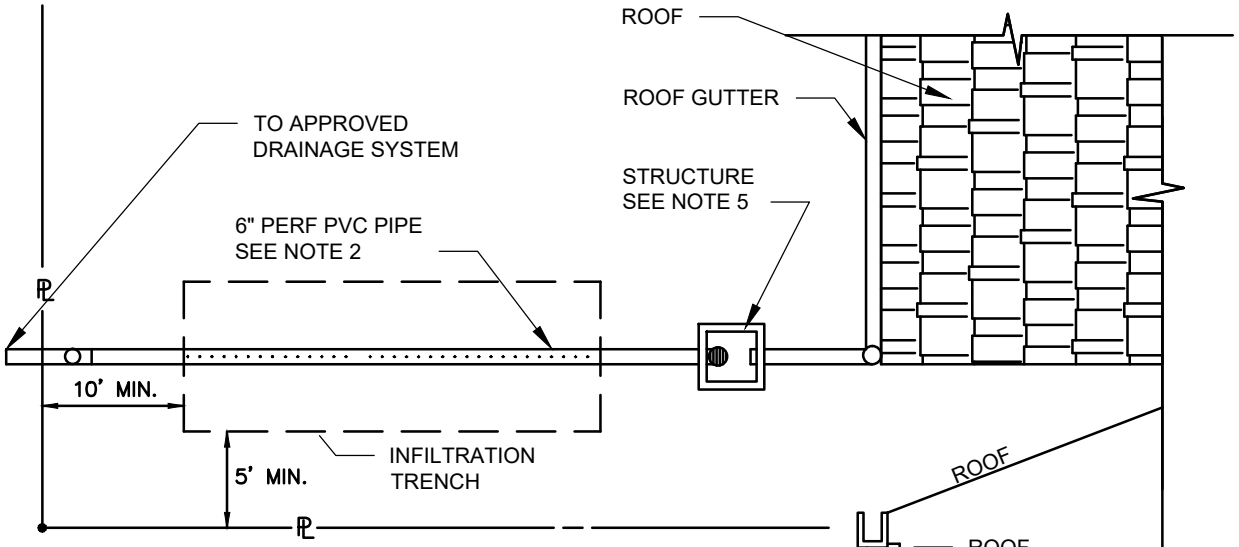
STANDARD DETAILS

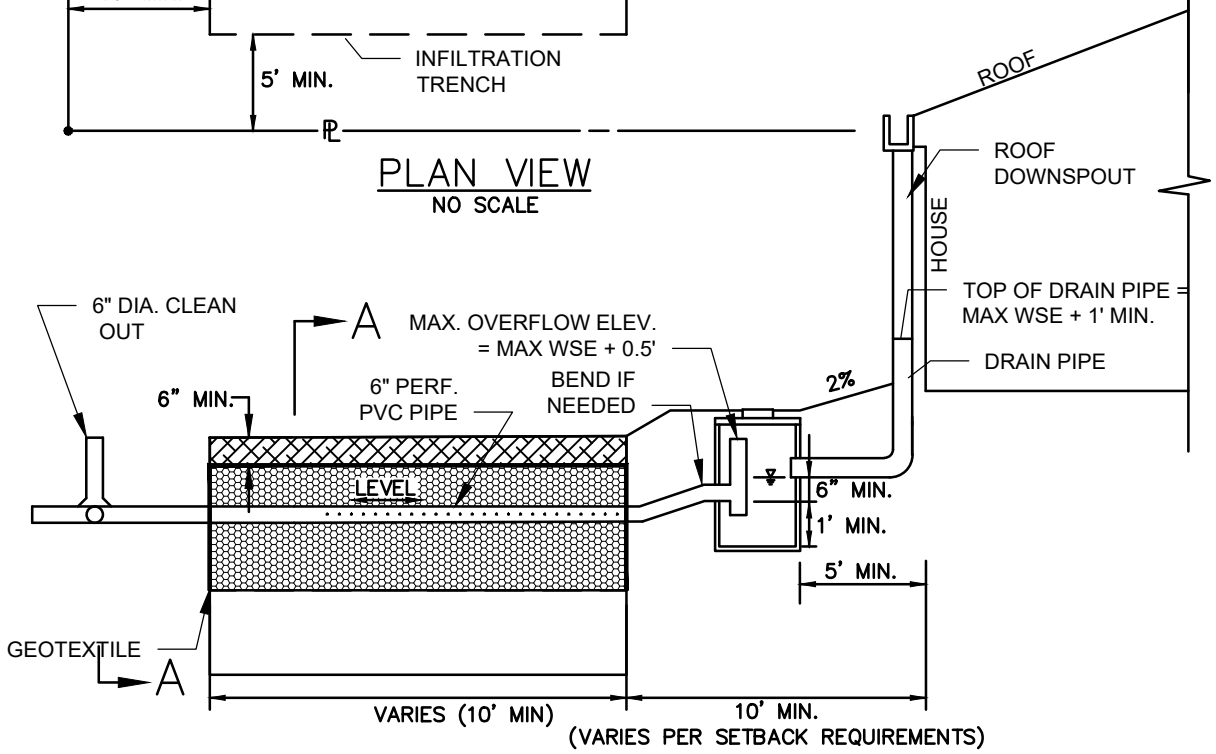
HYDRANT ACCESS AT PLANTER OR BIORETENTION

FILE NAME: SD671.DWG

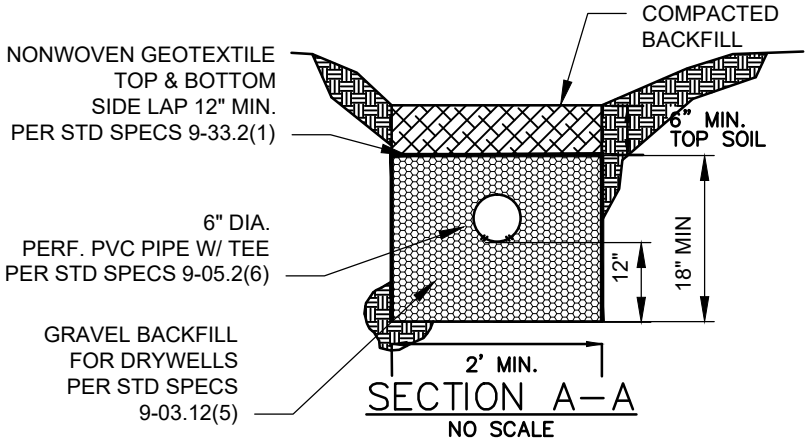
DETAIL NUMBER: 671



PLAN VIEW
NO SCALE



PROFILE VIEW
NO SCALE



SECTION A–A
NO SCALE

NOTES:

1. TRENCH SHALL NOT BE LOCATED WITHIN 100' OF A WELL OR 30' FROM ANY PART OF A SEPTIC SYSTEM.
2. CENTER PERF. PIPE HORIZONTALLY IN TRENCH.
3. REMOVE SEDIMENT AND FLOATABLES FROM TYPE 1 CATCH BASIN AT LEAST ANNUALLY
4. KEEP 5' SEPARATION BETWEEN EDGE OF TRENCH AND OTHERS UTILITIES
5. TYPE 1 CATCHBASIN IF LOCATED IN DRIVEWAY. YARD DRAIN IF LOCATED IN LANDSCAPE- 18" NDS MODEL 1882 OR EQUAL

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REVISION DATE: MARCH 01, 2018

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STANDARD DETAILS

PERFORATED PIPE CONNECTION

FILE NAME: SD673.DWG

DETAIL NUMBER: 673